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AMERICAN ACHIEVEMENTS AND AMERICAN FAILURES IN PUBLIC HEALTH WORK.

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Address of the President, American Public Health Association, Rochester, N. Y., September 7, 1915.

PUBLIC health work in America began early in the eighteenth century, with the introduction into New England of Oriental inoculation for smallpox by Boylston, and has achieved world-wide renown with the scientific sanitation of the tropical Isthmus of Panama early in the twentieth by Gorgas. The educating, organizing and equipping with sanitary machinery of a swiftly growing population—at first, sparse, but later sometimes intensely congested, and always fluid and unstable under the pressure of migrations and immigrations such as the world has never seen—is in itself a great achievement. But when that population is, like ours, lodged in a new environment, subjected to an unfamiliar and changeable climate, at times like that of Naples and at other times like that of Labrador, public health work is doubly difficult.

Under leaders like Boylston and Waterhouse, Shattuck, Walcott and Billings, and Reed and Gorgas—to whom we may now proudly add the name of Strong—sanitary information has been gathered and spread abroad and applied; vital statistics have been collected and studied; sanitary libraries have been formed; boards of health have been organized and directed; and epidemiology and other branches of sanitary science have been enriched and extended.

Various arms of the federal government have contributed materially to these achievements, *e. g.*, the United States Public Health Service, the Department of Agriculture, the Medical Corps of the Navy and, especially, the Army Medical Corps, which through the splendid and scientific labors of Reed, Carroll and Gorgas has solved some of the deepest mysteries, and overcome the worst difficulties, of tropical sanitation. Drs. Blue and White and their associates of the United States Public Health Service have also earned the honor and the gratitude of mankind by

their proof that, under proper administrative measures, the bubonic plague of the Orient and the yellow fever of the Occident may alike be held in check, while, as we are meeting today, Strong, in Serbia and Montenegro, formerly a government official but now representing various more private foundations, is winning fresh laurels for American public health measures. Thus the bold and brilliant epidemiological work of Boylston and Waterhouse, marking the beginning of experimental preventive medicine in the late eighteenth and early nineteenth centuries, has been continued and extended in the late nineteenth and early twentieth by their more scientific successors. Some of our state and city boards of health and some of our private institutions and laboratories have likewise lent invaluable assistance, as, for example, the Massachusetts State Board of Health, the New York City Board, the Rockefeller Institute and many others. Meantime, less original but not less enthusiastic and faithful work has been done by various associations for the promotion of the public health, such as the American Public Health Association, numerous anti-tuberculosis societies, organizations for the promotion of school hygiene, for the prevention of infant mortality, and the like. And now, happily, we have also at last, in addition to a number of creditable state, town and city boards of health, what is virtually a National Board of Health, namely the United States Public Health Service—a highly efficient arm of the Federal government.

Up to 1886, *preventive medicine*, chiefly in the form of vaccination, was the principal weapon for the promotion of the public health, but a long step forward was taken when, in that year with a reorganization of the State Board of Health of Massachusetts, sanitary engineering became a recognized and indispensable branch of public health science and public health service. Since that time *preventive sanitation*, and particularly the sanitation of towns and cities in respect to water supplies, milk supplies, ice supplies, sewerage, garbage disposal, street cleaning, the heating and ventilating of public buildings, the smoke nuisance, and other environmental factors of public health or ill-health, has come to receive close attention and treatment.

In the further development of preventive medicine and preventive sanitation, bacteriological laboratories for the quick detection of dangerous infections have since been installed almost everywhere, at least in the more progressive American cities and towns. We have begun the medical and sanitary supervision of schools and school buildings. We have invented, and put within the reach of all but the very poor, the most complete, convenient and salubrious heating and ventilating appliances in the world, for houses, theatres, halls, hotels and workshops. We have made ice, once a luxury for kings and emperors, a universal solace for all classes in hot weather. We have perfected and extended the preservation of foods by cold and by canning, so that seasonal scarcity is almost unknown.

We have invented and cheapened rubber clothing and especially rubber overshoes as a defense against our almost tropical rains. We have applied machinery to the manufacture of abundant and better and cheaper shoes and clothing. We have shown by experiment with a national spitting nuisance, the possibility of modifying unsanitary habits by education and reasonable sanitary ordinances.

But yet,—on the other hand,—we have thus far failed to achieve many much needed sanitary improvements. Our water supplies are to a great extent either in good condition or on the way to improvement, but our sewage disposal systems are still in many cases far from satisfactory. In this respect the parallel between the individual and the community is close, for while many intelligent persons attend carefully to the water they drink, most are negligent of their excretions, regarding as unimportant that regular and sanitary removal of wastes which is quite as necessary as the intake of wholesome food and drink.

Probably the most flagrant failure in American sanitation today is the almost universal lack of public convenience or comfort stations in American cities and towns. The stranger within the gates of most American cities seeks in vain for any public sanitary conveniences, being referred, if he is well dressed, to hotels or other semi-public buildings or, if he is poorly dressed, to saloons or railway stations, or other semi-private or public-service places. Some three months ago the leading newspaper of one of the proudest and most progressive cities of New England, which has since rejoiced to find itself "in the hundred thousand class," announced that its "first public sanitary . . . was opened Saturday morning, and will be open daily hereafter from 6 a. m. until midnight. The opening . . . marked the end of ten years of effort to get such a comfort station built." Failure like this to provide proper public toilet facilities in our towns and cities is to fail in one of the very elements of sound public health service.

We have also failed to reduce, as we should have done, typhoid fever in America. Of late much progress has been made in the right direction, but we need to remember that "it is the last step that arrives," and we have hitherto failed to attend closely enough to the single as well as to the seemingly final case. Like Nature, we are often "so careless of the single life, so careful of the race."

We have failed likewise to reduce as far as we should have done American infant mortality. Here undoubtedly our hot weather works against us, but so also does our milk supply, which can be and ought to be rendered safe by pasteurizing, and our parental ignorance and incompetence, which can be and should be lessened by education and the aid of public health nurses. We have as yet, and in spite of ample knowledge, failed to make our American milk supplies what they should be. This is partly because we have been too timid to insist that good milk not only costs more to make but is worth more and must therefore be paid for, and

partly because we have not yet taught the public as we should that the only safe milk is cooked milk, and for infants, milk that is pasteurized—preferably in the final container. I have myself lived through the last year of the period—now happily remote—when no milk was pasteurized by anybody; through the next in which only pioneers like Nathan Straus preached or practised pasteurization, while many if not most, physicians, deprecated the practise; through the one following, in which the scales began to turn in favor of pasteurization; and into the present when almost no one fully informed on the subject actively opposes pasteurization. And yet, even today, some physicians are shortsighted enough to tolerate if not to recommend the general use of raw milk, which still constitutes the great bulk of the milk used by infants and adults all over the land. Such use of raw milk we must count as long as it lasts one of our worst public health failures.

We have also failed thus far to pay proper attention to our American climate, which has been well described by a popular writer as "polar-tropic." Placed as we of the United States are on the latitude of southern Europe, Persia, and the northern parts of Africa and Arabia, we are exposed alike to the stimulating and dangerous sunburn of the south and the cold dry winds driving down upon us from the continental area of Canada and the high north. In this fact, perhaps, we shall some day find one of the principal causes of that eager, strenuous, often nervous and sometimes excited, condition which we may call "American-itis."

With vast regions given over to rural life, and with other regions, called industrial, small in area but teeming with life and noise, we have as yet only touched the surface of the public health problems involved. The same is even more true of the problems of alcoholism and venereal disease. Here we may learn by comparison with the spitting evil that it is easier to overcome habit than to conquer appetite, and doubtless we must be prepared for further disappointments, yet forever keep on trying.

Some streets of most American cities are disgracefully dirty and untidy. Dust, horse dung and other dirt, papers, fruit skins, old hats, abandoned umbrellas, discarded shoes and the like, are often seen lying about our streets. Yet these same streets are the principal playgrounds of the poor and ought for every reason to be kept scrupulously clean. We have devised excellent apparatus for heating and ventilating halls and houses in our polar winters but have neglected the almost equally important problem of cooling habitations and public buildings in our tropical summers. Our vital statistics are not yet adequate; our health boards are too often loaded up with political refugees, political doctors, and ignorant or incompetent laymen. Our health officers are frequently untrained, ill paid and only part time employees of a no-time board and even the best and most faithful may suffer from insecure tenure of office.

Lastly, and above all, I must put our almost complete neglect of personal hygiene. From 1720 to 1886 we had little to show in public health work beyond vaccination for smallpox —the fundamental procedure of *preventive medicine*. To this, which has since expanded immensely in various directions, we have added *preventive sanitation*, by which I mean the purification of water and sewage and milk, the control of mosquitoes against malaria and yellow fever, improved housing and other fundamentals of a sanitary environment. But we have not yet even begun to demand that study and care of the individual which is still more fundamental. We have as yet paid little or no attention to over-eating, overworking, over-drinking, deficient exercise, deficient sleeping, family hygiene, and the hygiene of special organs, such as eyes, ears, bowels, nose and feet, all of which I propose to group together under the term *preventive hygiene*. We have achieved much in preventive medicine and preventive sanitation, but we have as yet failed for the most part in preventive hygiene, which is perhaps the most important of all. Here, therefore, we may reasonably expect the greatest progress in the nearest future. Rightly studied, preventive hygiene will include personal, domestic, family and social hygiene. It will deal with celibacy and marriage, with housekeeping, with the high cost of living, with food economy, with domestic service, with child hygiene, and with the right conduct of mature and elderly life, as well as with personal hygiene. It will in the future play, perhaps, the principal part in solving many of the problems of American life, health, prosperity and happiness. Our teaching of physiology, both on the higher levels and the lower, has never emphasized as much as it should have done its practical hygienic applications to the conduct of life. In fact, our whole teaching of hygiene and sanitation has been grossly neglected. Even the best medical schools have paid but scant attention to these subjects, while the instruction given in our public schools has generally suffered from half-informed teachers and uninformed school committees. The best teaching of today is to be found, not in the text-books or the schools, but in the leaflets and booklets of certain boards of health and life insurance companies. This, surely, is a scholastic reproach which must not be allowed to stand.

In view of the high opinion which he is known to hold touching the promise and the potency of public health work, and especially of preventive medicine, I invited President Eliot, our most expert as well as our most distinguished American educator, to attend this meeting or, if he could not do so, to send us a message. His reply follows:

"I regret very much that my engagements will not permit me to attend the Health Congress to be held in Rochester, N. Y., on September 6–10. The subjects to be discussed at that Congress are of the utmost importance for all the American peoples; and, indeed, it has seemed to me for some time past that preventive medicine is showing us all the right way to deal

with all the evils which beset civilization. You and I remember very well when the total effort of the medical profession was directed to healing or curing people already suffering from disease. Boards of health in like manner tried to remedy evils already developed; they did away with cesspools, substituted pure water supplies for foul, and clean slaughter houses for dirty. The attention of the medical profession and of sanitary officers is given nowadays to the prevention of evil; and this is far the most effective way to conserve human life and energy.

"I believe that this method of preventive medicine is the one which should be universally applied for the defense of society against the evils which afflict it—such, for example, as alcoholism, prostitution and war. All the beneficent forces of society should combine to *prevent* these terrible evils. Medical research and preventive medicine are teaching the civilized world how to deal effectively with moral, as well as physical, diseases.

"Sincerely yours,

"CHARLES W. ELIOT."

In conclusion, I desire to express my humble appreciation of the honor conferred upon me by your gift of the high office which I hold. The American Public Health Association is today a splendid force in the land. Its JOURNAL, under the able editorship of Professor Gunn, our devoted and energetic secretary, is worthy of the great body which it represents. It is your duty and mine to strengthen his hands, to increase our membership and to help on the good work. If the Association continues to grow in numbers and in influence along the broad path thus far pursued, remaining democratic rather than bureaucratic, it will long be worthy of the great name —"American"—which it so honorably bears. Two of our component countries, the Dominion of Canada and the Republic of Mexico, are bearing the heavy burdens of war, the one foreign, the other civil. Both have the liveliest sympathy of their confrères in this Association. It may seem to some as if, under the shadow of a war characterized as never before by the destruction of life, efforts for saving life, through hygiene and sanitation, must be of small moment. But it is not so. After the clouds—the sun. And we believe that after the present bloody conflicts are ended—and may that time quickly come—the races of mankind will turn as never before to the nobler pursuits of Life, Liberty, Health and Happiness. When that time comes, the eternal principles underlying these things will once more move and inspire the nations as sunshine warms and quickens the earth after a storm. Meantime, we must prepare for active and intelligent dealing with the thousand new and mighty problems which these wars are certain to bring before us and to this task we turn with cheerful courage.

THE PUBLIC HEALTH.

HONORABLE CHARLES S. WHITMAN,
Governor of the State of New York.

Address of Welcome to the American Public Health Association at the Annual Conference of the Sanitary Officers of New York State and the New York State Sanitary Officers' Association, Rochester, September 7, 1915.

I FEEL it a privilege and a pleasure to welcome on behalf of the Empire State the various organizations which are meeting in Rochester this week for the purpose of discussing the problem of the public health.

At the present stage of social development it seems essential that a nation should be prepared for defense against the attacks of human foes. It is quite as essential that it be efficiently organized for the campaign against those invisible foes which in the long run work a more terrible havoc than even war can boast. The American Public Health Association, representing as it does the best in public health science which the whole North American continent can offer—bearing on its program the insignia of the Dominion of Canada and the Republics of Mexico and Cuba, as well as of the United States—is a splendid example of a truly international army engaged in the noblest of all wars—the War against Disease.

I am glad, too, to welcome to this platform the president of the American Public Health Association, Prof. W. T. Sedgwick, not only as the presiding officer of the body which he so honorably represents, but as a citizen of the United States whose unique services as investigator, and teacher in his own laboratory, and as a preacher of the gospel of public health throughout the country entitle him to the gratitude of all. I am informed that of the seven Directors of Divisions in the New York State Department of Health, three are "Sedgwick's boys" which may be taken as some measure of the extent to which his influence prevails in the field of public work.

It is a fortunate thing that it has been found possible to call the Sanitary Officers of the State of New York to meet for their Fifteenth Annual Conference at the same time and place with the American Public Health Association. The health officers of the cities and villages and towns of New York will profit by contact with the leaders in public health science represented in your organization; and we trust that you may find something of interest in the methods of health administration characteristic of the Empire State. Professor Sedgwick's position as a pioneer on the academic side of public health science is matched by what Doctor Biggs has done on its practical executive side; and the results obtained under his twenty years of leadership by the New York City Department is perhaps the best example you have of the definite results in life-saving which may be attained by a scientifically and aggressively conducted public health campaign.

Finally, I am glad that these aus-

picious meetings are to take place in Rochester; because Rochester is well known to all New Yorkers, and probably to health workers as well, for the efficient health administration of Health Officer Goler and for the splendid public service rendered by the Rochester Public Health Association under the leadership of Doctor Leary.

I have said that I hoped we could show you some few things of interest, in part return for the manifold benefits we shall receive from your deliberations. In particular, I would commend to your consideration our plan of state sanitary administration, of which we are particularly proud and which a number of other states—Massachusetts and New Jersey being the latest examples—have more or less closely followed in reframing their own public health laws.

The first important principle embodied in the New York Health Law is the delegation to a Public Health Council, composed of the Commissioner of Health and six appointive members, of the power to establish qualifications for directors of divisions, sanitary supervisors, local health officers and public health nurses, and to establish sanitary regulations dealing with "any matters affecting the security of life and health, or the preservation and improvement of public health in the State of New York" outside of the city of New York.

This delegation to a small expert body of the power to formulate a sanitary code is essential to sound sanitary progress. The requirements of modern sanitary health regulations are so complex and must be subject to such constant modification that a code enacted by a legislative body must necessarily be either unduly repressive or so vague as to be of little practical value. It is undoubtedly a matter of serious moment to confer such powers upon a small body, but with the proper personnel this method furnishes the only satisfactory method of working out the problem. We are fortunate in having such men as Dr. Simon Flexner, Dr. T. Mitchell Prudden, Prof. H. N. Ogden, Mr. Homer Folks, and Dr. Wilhelm Gaertner, and such a woman as Mrs. Elmer Blair upon our Council. The American Journal of Public Health, the official organ of your Association, in its issue for last October, said of the first sections of the Code promulgated by the Public Health Council: "This really notable sanitary document embodies the most recent advances of public health science more completely than any similar set of regulations with which we are acquainted, and offers convincing evidence of the wisdom of delegating powers of this sort to a small and expert body."

While the Council is thus given what amounts practically to a delegated legislative authority within its special field, it has wisely been given no executive functions. Concentration of responsibility is essential to administrative success, and the State Commissioner of Health is solely responsible for all the executive policies of his Department.

The most effective health work in any community can always be carried on by someone on the spot, who knows

the local situation and is a part of the community which he is serving. A serious difficulty, however, arises in regard to the prosecution of such work in small communities, because the adequate technical knowledge is usually not available. The New York law meets this difficulty by a very successful expedient through the creation of a group of twenty district sanitary supervisors who act as intermediaries between the State Department and the local health officer, bringing to the latter the technical knowledge and the moral support of the state organization.

These sanitary supervisors, appointed under the provisions of the Civil Service Law, have rendered invaluable service during the past year, and I regard them as forming one of the most essential elements of an efficient state health organization.

Responsible public officers are today confronted with serious and difficult problems in regard to the desirable expansion of public activities along what may be roughly designated as social service lines. Public health is only one of many fields of public work which are growing and expanding year by year, and demanding constantly larger appropriations which they are able to justify by valid evidence of excellent results attained. Meanwhile city and state debts and tax rates are mounting to an unprecedented degree. Some of the money needed for such beneficent work may be obtained by the elimination of waste in the conduct of the government such as we have been able to accomplish along many lines in New York State during the past year. Somewhere, however, there must come a stopping place. We must recognize that there are things which are good to do for humanity's sake—things which would bring in large return through the saving of economic waste—and yet that we cannot undertake to do these things because we cannot afford it. When that time comes, however, public health is one of the social activities of the state whose development should be curtailed only in the very last necessity. The work which your Association is doing throughout the North American continent is one of the noblest works which can enlist the energies of man; and permit me to say that here in New York State we fully appreciate its unique importance and its limitless possibilities.

There were over 140,000 deaths in New York State during the year 1914 and, if the estimates of the Committee of 100 on the Conservation of Human Vitality are to be relied upon, 40 per cent. of this mortality might have been prevented. Think of it—over 50,000 lives needlessly lost in one state during a single year.

Over 23,000 of these 140,000 deaths occurred among infants under one year of age; and this fraction of the death-rate is that which appeals most strongly to our sympathies, while it offers the most brilliant opportunities of service to the public health worker.

New York has devoted special attention to this problem and with most gratifying results. In 1913 the infant mortality rate for the state was 109 deaths under one year for every 1,000 births. The State Department of

Health in 1914 and during the present year has bent every effort toward reducing this figure. Exhibits were prepared dealing with infant welfare and were sent out throughout the state. The energies of the Department were particularly directed toward the establishment in every municipality of Infant Welfare Stations, which have everywhere proved such effective agents in reducing the waste of infant life. This campaign has recently been supplemented by the organization of a concerted campaign for Little Mothers' Leagues throughout the schools. The result has been that the infant mortality rate of the state for 1914 fell to 101, and 1915 has so far shown a better record even than 1914. This reduction in the infant mortality rate from 109 to 101 corresponds to a saving of nearly 2,000 infant lives which in itself is a splendid return on the total cost of maintaining our state and local departments of health.

The acute communicable diseases, such as typhoid fever, diphtheria, scarlet fever and the like, are passing year by year more completely within our control. Typhoid fever killed 1,368 persons in New York State in 1908 against only 867 in 1914; while the number of deaths from scarlet fever has fallen in the same period from 1,667 to 682. Diphtheria remains by far the most important of this group of the acute contagious diseases; and if, as I am assured, the 2,000 annual deaths from this disease in New York State are due largely to delay or neglect in applying a simple and efficient remedy in the form of diphtheria antitoxin—there is surely a grave responsibility resting upon the practicing physician to remedy this deplorable condition of affairs.

Tuberculosis remains the most difficult and important single problem which confronts you in your work. The death-rate from this disease has fallen greatly during the past twenty years, but the rate of reduction has been very slow of late, and even last year this one disease cost New York State 16,000 lives. We have, as I believe, very wisely adopted the plan of providing for the care of this disease by counties, and 31 out of 57 counties in the state now have county hospitals either in operation or definitely provided for. One of the greatest needs of the moment, as I am informed, is for public health nurses to work in the various communities, to discover cases of the disease in their earlier and more easily curable stages, and to assist patients who must remain at home to maintain so far as possible conditions which ensure their own recovery and protect their families from infection.

As a man who has recently passed the danger line of 45 years, I am beginning to feel a keen personal interest in the campaign which public health officials are waging against the degenerative diseases of adult life. It is certainly a disconcerting thing that, while you are gaining ground, if only trench by trench, at all other points on the battle line, the death-rate at ages over 45 should show unmistakable signs of actually increasing. I have good hope, however, now that the problem is clearly recognized, that your efforts to induce the public to

observe the rules of personal hygiene and to undergo a periodic medical examination for the detection of these diseases at a curable stage will bear fruit in the near future. I can assure Commissioner Biggs that I shall personally make every effort to follow the rules of moderation in all things which he lays down in the exhibit of the Hygiene of Adult Life which all of us over 45 have been studying this afternoon.

Seriously, I wish it were possible to make the public realize as you and I realize how much this campaign against preventable disease really signifies. The death-rate in New York State was 15.0 per 1,000 in 1913 and 14.6 per 1,000 in 1914. The figures are so close together that they seem wholly insignificant to the casual observer. What does four-tenths of a point in the death-rate mean to the average citizen? It meant all the difference between life and death for 4,000 men, women and children in New York State last year; for this reduction in the death-rate corresponds to a saving of 4,000 lives. Taking the ordinary estimate of $5,000 for the average value of a human life, this means an economic saving of $20,000,000 due to progressive health work in a single year.

The higher ethical standards and the broad humanitarianism which have developed among large masses of the people in these recent years imperatively demand that the health and social service activities of the government shall be absolutely divorced from politics. Such has been the record in my judgment of the administration of the State Department of Health since its reorganization under the revised Public Health Law, and such will be the future course of all such activities in the state government during the remainder of my administration as Governor.

I greatly regret that the legislature at its last session did not make appropriations adequate to fully maintain the work of certain divisions of the State Department of Health—and especially the Division of Sanitary Supervisors, whose work has proved most important and beneficial to the local communities, and by means of whom the knowledge and skill of the expert Sanitarians of the Department of Health are placed at the disposal of the health officers of even the most remote rural districts. I sincerely hope that some means may be found by which the services of these physicians may be retained, and feel confident that next year, when the members of the legislature are made fully acquainted with the facts as to the value of these services, funds will be provided for their continuance. I shall use my influence to attain this end, for while rigid economy in the administration of the finances of the state is essential, savings in expenditure attained through decreased efficiency in health work are not only unwise but resolve themselves in the end into irreparable waste of the most valuable resources of the Commonwealth. As compared with the first seven months of 1913, I am informed that the infant death-rate for 1915, outside of New York City, has been reduced from 127 to 97 per thousand births, or 30 points. This is a very remarkable achievement in two years and work which produces such

results must not be interrupted. If this rate is maintained for the remainder of the year it will mean a saving of more than 2,500 infant lives.

The promise of the Commissioner of Health made at the beginning of this year to save 25,000 lives in the state in five years seems almost certain of realization, if only the necessary support is accorded to the Department in its work.

We are confident that this pledge will be more than redeemed. To the attainment of this splendid goal I pledge my cordial and hearty support so long as I am Governor. I trust that New York may not only wage a successful war against preventable disease within her own borders, but that her example may be of assistance to you who are fighting the same battles through the length and breadth of the North American continent.

The crowning glory of this twentieth century is to be found not in the great industrial progress and commercial development—not in the marvelous scientific discoveries—not in the incredible expansion and efficiency of its military organization, but in the improvement in the social condition of the masses, and in the higher standards of living, rendered possible to a large extent because the losses from sickness and death have been so enormously reduced by the extraordinary developments in preventive medicine, and sanitary science. To Pasteur and Lister, and Koch, and Behring and Ehrlich in Europe, and to Reed and Flexner and Theobald Smith, and General Gorgas (who is with us tonight) in this country, to them and their associate workers in scientific medicine is the greater honor due.

DEVELOPMENT OF AMERICAN PUBLIC HEALTH ENDEAVOR.

STEPHEN SMITH, A. M., M. D., LL.D.
of New York,
Founder and First President of the American Public Health Association.

Read before the General Session of the American Public Health Association, Rochester, N. Y., September 8, 1915.

Mr. President and Members of the Association:

LOOKING backward half a century and tracing the logical course of events, scientific sanitation of communities as a preventive of epidemic pestilences had its origin in England as the result of a very simple incident in 1849.

Cholera was approaching England for the first time since its appalling decimation of cities and villages in 1832. Public alarm became so intense that the clergy was moved to resort to the old method of arresting the progress of epidemics and thus allaying the apprehensions of the people by the appointment of a day of National humiliation and prayer. A large and influential committee of clergymen was selected to visit the Prime Minister and request him to issue the usual proclamation. His reply was to this effect:—"Go back to your homes and make them and their surroundings clean and keep them clean, then ask the Almighty to bless your efforts at protection against the pestilence."

The clergymen and religious classes of England were shocked at his irreverence and astonished at his reliance on such a trivial measure for protection from a pestilence sent by God as a punishment of the sins of the people. The day of fasting and prayer was accordingly held, under the sanction of the Church, throughout England.

The cholera came and wrought its usual havoc in the cities and villages of the country, being stayed in its progress by neither the prayers of the clergy, nor the fumes of sulphur burned in the houses and streets, the most potent preventive agent against the spread of pestilences then known. The Prime Minister's advice was not only not followed, but was the subject of universal ridicule.

At length the cholera disappeared as it came of its apparent own free will. The Registrar General then proceeded to "take stock" of the results of the visitation and found that the toll was very heavy, not only in the reduction of the population, but in the amount of sickness, misery and domestic waste that followed in its trail. But one bright spot illumined the dark picture which he drew of the results of the epidemic. A small interior town reported that not a single case of cholera had occurred among its people though it visited all of the neighboring villages with great mortality of the people. On inquiry as to the reason that this little hamlet was passed over by the pestilence it was learned that the authorities had taken the Prime Minister's advice to the Committee seriously and had not only thoroughly cleaned

the homes, the streets and all waste places, but had appointed a "Vigilance Committee" with full power to enforce cleanliness. It farther appeared that not only was the town saved from cholera by this simple and rational means but there was a great diminution of all forms of disease. This incident made sanitation a science in England. It became the popular political demand of candidates for office and one very prominent politician was so annoyed by questions as to his views of certain current sanitary questions that he cried out, "Sanitas sanitatum omnis sanitas." The Premier's words were "Apples of gold in pictures of silver."

In 1863–4 the initial incident occurred in New York City which gave the vital impulse to sanitary reform in this country. An epidemic of typhus fever was raging, causing widespread alarm. While in charge of a typhus fever hospital my attention was called to the large number of cases that came from a single house. For the purpose of determining the conditions under which the people lived I visited it and found it a typical fever nest—a filthy, deserted building, the resort of immigrant families. The attempt to clean or close this house disclosed the fact that there was neither law, ordinance, or force, of any legal form, adequate to effect that object.

These facts becoming public excited an interest amounting to indignation and led to a "Citizens Association" undertaking to secure adequate health laws. The final outcome of the agitation was the enactment of the Metropolitan Health Law, in 1866. This law was drafted by Hon. Dorman B. Eaton and myself after an examination of existing health laws. By its perfection in details and especially by the extreme power which it gave health authorities in the performance of their duties, it was revolutionary.

We incorporated in the Metropolitan Law a new feature which created an epoch in the administration of sanitary laws and ordinances. Hitherto, health authorities, like other public officials, were liable to be restrained in the performance of their duties by the courts and thus it became difficult often to remove nuisances dangerous to life and detrimental to health. It seemed to us that simple common sense dictated a provision of the law that when the health authorities officially declared any matter or thing dangerous to life and detrimental to health nothing should interfere with the Board's order of abatement. Accordingly a clause of the law was drafted forbidding any court proceedings delaying or obstructing its abatement of nuisances.

Practically it was an anomaly in municipal government, as it created a Commission with power to make and execute its own laws and sit in judgment on its own acts. It was a veritable "Imperium in Imperio." Its constitutionality was tested in the courts but it was sustained and for half a century it has given to New York its most popular and useful department of government. So apprehensive was the legislature that it would prove expensive that its expenditures were restricted to $50,000 annually. Now it is freely accorded $4,000,000.

And the city has been richly rewarded for its expenditure. The mor-

tality of its people has been reduced from 38 in the 1,000 to 12 in the 1,000, which means that 26 persons in every 1,000 are now annually saved who would have died in New York City if the conditions fatal to life were the same as half a century ago. These figures carried to a logical conclusion give the following almost incredible results, viz., if, in every 1,000 population, 26 are saved, in 100,000 population, 2,600 are saved, and in 1,000,000 population, 26,000 are saved and in a population of 5,000,000 the present population of the city, 130,000 are annually saved who would have perished if the conditions affecting the public health were the same as in 1866, the date of the enactment of the Metropolitan Health Law.

It is true that many public improvements have contributed to these extraordinary results, but even these were for the most part the outcome of the agitation for city cleanliness.

The American Public Health Association had its inception in the Metropolitan Board of Health. During the three years' struggle to secure the law under which it was organized, a widespread interest was created in the general subject of civic sanitation. This was greatly intensified by the success of the Metropolitan Board in its complete control of an epidemic of cholera which attacked the city immediately after the organization of the Board. Efforts were made in different cities to organize health departments but there was that lack of cordial public support essential to success. It was evident that the most pressing need of these efforts, to give permanent success, was the creation of a dominant public sentiment like that of England which would not only sustain, but would demand sanitary reform of public officials.

As a Commissioner of the Metropolitan Board I had a large correspondence with those interested in promoting sanitary organizations, and in conference it was determined to undertake a campaign of education through the medium of a nation-wide association, whose annual meetings in different parts of the country and whose publications would tend to awaken and maintain the active and permanent interest of the people in sanitary administration. The organization of this Association at Atlantic City followed.

Nearly half a century has elapsed. Has the Association fulfilled its high mission as expressed in its Constitution, "The advancement of sanitary science, and the promotion of organizations and measures for the practical application of public hygiene."? To effect "The promotion of organizations and measures for the practical application of public hygiene," one of the earliest acts of the Association was to instruct the Secretary "To open correspondence with local health authorities of all parts of the United States, requesting information upon matters relating to the health of their respective localities, and offering to reply to any inquiries on similar subjects which may be made by them."

This correspondence led to the diffusion of a vast amount of information on questions relating to the necessary provisions of sanitary laws, the plan of a well organized board of

health, the methods of sanitation of cities, the use of disinfectants. These were new subjects with which few were familiar and yet they embodied the basic principles of the practical application of public hygiene. Boards of health increased rapidly and each was organized with adequate powers and equipment.

The annual meetings were planned with a view to the greatest possible effect on the people of the locality. To this end the sessions during the day were devoted to the reading and discussion of papers, and the meetings of the evening to the addresses of popular speakers. Personal observation of these meetings convinced me of their great importance in awakening an interest in sanitation of a class of people who could not otherwise be interested. The membership of the Association was also greatly increased. The first meeting in Cincinnati, the second in New York and the third in Philadelphia were notable for the public interest excited locally and throughout the entire country by the wide publication of its proceedings.

During the past few years there have been strenuous but unsuccessful efforts made by a Committee of One Hundred eminent citizens to secure the creation by Congress of a National Department of Health with a Cabinet Secretary at its head. It is an interesting fact that this Association, at its preliminary meeting at Atlantic City, took cognizance of the need of a national health authority, and that subsequently it appointed a committee empowered to take such action as was deemed necessary to effect that object. For a time the committee failed to accomplish anything, but taking advantage of the great epidemic of yellow fever of 1878–9 it secured the necessary legislation and the establishment of a National Board of Health. Unfortunately the law contained a clause limiting its existence to four years and at the end of that period it lapsed. It had done valuable work, especially in its investigations of the yellow fever epidemic and of an outbreak of cholera. Meantime its appropriations were transferred to the Marine Hospital Service on which Congress conferred, from time to time, public health duties of such a distinctive character as to entitle it to be known as the Public Health Service.

In these now historical events we have an explanation of the failure of the Committee of One Hundred to establish by act of Congress a fully organized Department of Health. A generation earlier we learned that Congress is averse to creating a new Department in the Government, but it will increase the duties and powers of subordinate branches of the public service, and if that service is so conducted as to establish a manifest necessity of its being elevated to the position of an independent Department of the general Government with a Cabinet officer at its head, Congress readily yields and enacts the necessary laws. In this manner existing Departments, like that of Agriculture, have been established.

Impressed by these facts in our early experience I suggested, at the Buffalo meeting, that the Association take such action as will secure from Congress the legislation necessary to

make "The Public Health Service" "The Department of Health" of the government. It must be evident to every one familiar with the operations of that Service during the last decade that it has gradually assumed a position that requires little more than an adjustment to its new relations to other Departments of Government and a broadening of its powers, duties and equipment, to make it a most complete Department of Public Health. Its altogether admirable methods of research, its successful efforts to control and exterminate the bubonic plague, its judicious coöperation with municipal and state health authorities and its world-wide watchfulness of the movements of contagious diseases as they affect emigrants to this country, entitle it to the confidence and support of Congress. I can conceive no greater public service that the Association can render the country than the installation, through the medium of necessary legislation, of the United States Public Health Service as the Department of Public Health of the government and thus accomplish one of the first objects of the Association. And the time seems to be especially opportune for such an effort owing to the interest in the question, both in Congress and in the country, due to the widespread agitation of the subject by the Committee of One Hundred.

Mr. President:—I fear I have trespassed too long upon your time and patience with these crude reminiscences of the early days of the Association, but my deep and abiding interest in its success will, I trust, be a sufficient apology. I esteem it a remarkable privilege that I am permitted to attend this Forty-third anniversary meeting. With the exception of the distinguished Professor Emeritus of Chemistry of Columbia University of New York, Charles F. Chandler—like Job's messengers—I can say, "I only am escaped alone to tell thee" the events that led to, and attended, the organization of the Association.

I well remember the *personnel* of the small but enthusiastic gathering at Atlantic City on the 12th of September, 1872, forty-three years past. There were Bacon of New Haven; Harris, Chandler, Janes and Morris of New York; Hartshorne of Philadelphia; Cox of Washington; Rauch of Chicago; Clendenin of Cincinnati; Woodworth of the Marine Hospital Service—all but two silent now and forever more. But their works do follow them. In great feebleness, but with abiding faith, they planted the tree, now grown to such dimensions, whose leaves are "For the healing of the nations."

AN APPRECIATION OF HENRY LOMB.

Rev. Clarence A. Barbour,
President Rochester Theological Seminary.

An Address before an Open Meeting of the American Public Health Association, Rochester, N. Y., September 7, 1915.

THIS hall has seen many significant and memorable assemblages, but none more significant nor more memorable than that of June sixteenth, seven years ago. On that day the body of Henry Lomb lay here, amid such tributes of honor, respect and love as are granted to few among the sons of men. Over the hushed thousands within these walls and the many who could not gain admission, brooded the influence of an hour such as comes but rarely in the history of any community. By order of the city's chief executive, and in solemn recognition of the going of Rochester's great commoner, flags floated at half-mast, silent symbols of a city's grief. Three days before, among rich and poor, the exalted and the lowly, among his comrades in arms and his contemporaries in the city's life, among the captains of industry and the great body of industrial workers, among the teachers and children of the public and parochial schools, there was the one accent of sorrow as the news came that Henry Lomb was dead. He had no enemies; he had lived a friendly life; not a life of passive good will, of lethargic benevolence, but a life of that philanthropy which seeks opportunity for useful ministry, of that benevolence which studies the needs of humanity that it may spend itself in practical service. Never has there gone from this city into the silence beyond a more gentle and unselfish spirit, or one more widely and gratefully loved.

Well nigh the full fourscore years of life were granted him. The psalmist says of those attaining this age that their strength is but labor and sorrow. His years were years of labor, for he was no favored child of fortune. His splendid business success, with its resultant wealth, he earned, by ceaseless toil, from the humblest beginnings. Labor, indeed, characterized his life, but sorrow not wholly so. Doubtless he had his personal griefs. If he had them, he did not tell them. But to our certain knowledge there was much of joy in his life, for he knew that numberless homes and countless lives were brighter because of him, and this brings joy that the world cannot give and cannot take away.

The gathering of that day was cosmopolitan. There were his comrades in arms, survivors of the cruel days of war, chief among them the old Thirteenth, which had passed not unscathed through the fiercest battles. Henry Lomb was the captain of Company C in that regiment, winning his rank, as he won all else, by distinguished merit. There were men and women by the thousand, employees of the great business which he and his partner, John J. Bausch, happily still

among us, had made world-wide in name and fame. What careful consideration for their welfare did they remember of him! To him they were never "hands," they were living personalities, whose interests everywhere and always were his own. There were Sons of Veterans and Spanish War Veterans, men of a younger generation. His heart was ever kept in youth by friendly contact with young men. There were representatives of the institutions which the president of the University said in his address upon that occasion were his monuments—the Mechanics Institute and the Rochester Public Health Association. More than twenty years before he had assisted in the organization of the Mechanics Institute, and was chosen its first president. It is not too much to say that but for him the Institute which means so much in the life of the community would never have come to its high estate. There were city and county officials, to lay the crown of community honor at his feet. There were hundreds of girls from the eighth grades of the public and parochial schools, in recognition of his wise and gracious provision which year by year freely gave to the girls of that grade the opportunity of the course in cookery in the Mechanics Institute—one phase of his constant interest in the training of school children for useful living. It is well that the Board of Education has placed the name of Henry Lomb upon one of our public schools, a memorial of him for generations to come.

And now, in this annual gathering of the American Public Health Association, assembled in the same hall which held that gathering of seven years ago, I am asked to pay brief tribute to the memory of this man, whose name can never be forgotten in the history of this organization or in the record of the total work for the safeguarding and promotion of the public health. For years he was a regular attendant at the meetings of this Association, as well as one of its chief financial supporters, and he was constant in his endeavors to advance its interests, as well as those of public hygiene, through every educational and feasible means. His long-time friend, Doctor Bryce, chief medical officer of the Department of the Interior in the Dominion of Canada, informs me of a fact not generally remembered, that toward the end of his life, wishing to leave some permanent testimonial of his interest in public health, he gave the sum of $2,500 as a trust fund, to be devoted to the interests of the Association in whatever way it might deem wisest and best. This was the fund of which the Publication Committee of the JOURNAL of the Association made use to supply credit at the bank, and with that start the JOURNAL was made a success and became practically self-supporting.

Through Captain Lomb's munificence there came into being the so-called Lomb Prize Essays, which the American Public Health Association has distributed by the tens of thousands. Of them and of him the Association says: "That these essays may be placed in the hands of every family in the country is the earnest desire of the Association, as well as the heartfelt

wish of the public-spirited and philanthropic citizen whose unpretentious generosity and unselfish devotion to the interests of humanity have given them." The titles are significant of the direction in which the mind of Henry Lomb most easily and naturally worked. Each essay was written by a master in the field of which he wrote. These are the titles:

"Healthy Homes and Foods for the Working Classes."

"The Sanitary Conditions and Necessities of School-Houses and School Life."

"Disinfection and Individual Prophylaxis against Infectious Diseases."

"The Preventable Causes of Disease, Injury and Death in American Manufactories and Workshops, and the Best Means and Appliances for Preventing and Avoiding them."

"Practical Sanitary and Economic Cooking Adapted to Persons of Moderate and Small Means."

Of Captain Lomb's connection with the Rochester Public Health Association I can speak only a word, but that is one of warmest appreciation and gratitude. In his death the Association lost its founder and its best friend. Through him it was organized, on the eightieth birthday of Dr. E. M. Moore, another of Rochester's great citizens, and it was at his request that Doctor Moore was elected its first president. For ten years he maintained it almost alone, so far as ways and means were concerned, in the belief that the work ought to be done, and that in time the community would recognize the need and come to the support of the Association, as it has. His support of the Rochester Public Health Association, as all else to which he gave, was rendered in so modest and unassuming a way that the public at large had no opportunity to know the measure of his generosity. He always insisted that his name and personality should be kept in the background, his only desire being to serve his fellow men without thought of reputation or reward.

Henry Lomb has gone, but in his case the good is not "interred with his bones." "Republics are ungrateful," says one. Equally, I suppose, it would be said of communities and organizations. But they are not always ungrateful, certainly not to him of whom we think at this hour. Gentle, retiring, kindly, generous, self-effacing Henry Lomb! To some of us he was a friend and comrade, whose place can never be filled by another. It is well that those who did not know him shall be reminded that such a man has lived his life among us, and that much of what is seen today in the field of this Association's activity tells that his works do follow him. Some of his seed-sowing was in good and honest soil, and the harvest has been great, though its completeness is not yet.

Some people are greatly impressed by the multiplying power of evil and of wrong. They are fond of quoting:

> "This lie brought forth others,
> Dark sisters and brothers,
> And fathers and mothers—
> A horrible crew!"

That is too true, but we sometimes forget that the principle applies with equal

certainty to goodness and truth. The lines may be altered to read:

"This truth brought forth others,
Bright sisters and brothers,
And fathers and mothers—
A radiant host!"

That which Henry Van Dyke wrote of another may with equal truth be said of our friend whose memory we pause tonight to honor:

"Oh, quick to feel the lightest touch
Of beauty or of truth,
Rich in the thoughtfulness of age,
The hopefulness of youth,
The courage of the gentle heart,
The wisdom of the pure,
The strength of finely tempered souls
To labor and endure!

You followed, through the quest of life,
The light that shines above
The tumult and the toil of men,
And shows us what to love,
Right loyal to the best you knew,
Reality or dream,
You ran the race, you fought the fight,
A follower of the Gleam.

. . . . .

Now well you fare, in God's good care,
Somewhere within the blue,
And know, today, your dearest dreams
Are true,—and true,—and true!"

THE RESPONSIBILITY OF THE CITY IN THE TUBERCULOSIS MOVEMENT.

THEODORE B. SACHS, M. D.,
Chicago.

Read at the Eleventh Annual Meeting of the National Association for the Study and Prevention of Tuberculosis.

IN A systematic effort toward gradual elimination of sources of tuberculous infection, a municipality is confronted with a number of factors, geographically or legally outside of the domain of municipal control. The very sphere of municipal control is dependent upon state legislation; the control of some factors lies, by their nature, within the exclusive authority of the state and the control of others calls for coöperative arrangements between the state, county and city.

The factors, within the control of the state are: (1) enabling legislation permitting a broad sphere of municipal control of the disease, through all the necessary administrative and institutional arrangements; (2) advancement, if necessary, of such municipal or county administrative and institutional control of the disease, by state subsidy or special tax; (3) measures insuring a milk supply free from tubercle bacilli, before the milk reaches the limits of the municipality; (4) statewide educational campaign bearing on prevention of the disease; (5) state legislation bearing on conditions of labor responsible for prevalence of tuberculosis.

RESPONSIBILITY OF A MUNICIPALITY IN THE CONTROL OF TUBERCULOSIS.

One of the fundamental functions of a municipality is protection of health of its citizens. The recognition of the importance of this function is finding expression in the steady progress of our municipal health departments, from mere bureaucratic offices, poorly financed and inefficiently managed, with its narrow functions of "issuing permits," "abolishing" flagrant nuisances and "recording" mortalities, to real health departments, well financed and efficiently managed to fulfill the great function of promoting health and preventing disease.

Among the various phases of the municipal health problem, tuberculosis is naturally receiving growing recognition because of its widespread prevalence, its large number of deaths, representing about one tenth of the entire mortality (one third of the deaths occurring at the most productive period of life), a morbidity of various degree affecting at least one per cent. and latent infection impairing the health and working power of at least 10 per cent. of the population, the baneful influence on the general health standards and the resulting great economic loss.

The trend everywhere is toward gradual supplanting of the pioneer enthusiastic work of private antituberculosis organizations by the more comprehensive, more correlated system of control of the disease by efficient municipal health departments.

In this period of gradual change from

private effort to municipal action, the time is most opportune for formulation of standards and right scope of municipal activities in the matter of control of this most widespread disease.

The Scope of Responsibility of a Municipality in the Control of Tuberculosis.

In the last two decades the scope of work of municipal health departments has grown in proportion to the gradual recognition of health as an important communal problem. The progress has been against many difficulties still existent. Chief of these are a part of the old order of things, in which municipal health offices occupied a subsidiary position, with many of their functions distributed among other departments of the city government. Constant opposition is being also manifested to the further expansion of control over conditions which the enlightened judgment of communities tends to place within the domain of municipal regulation.

With our present experience with the health situation in municipalities of this country, it is evident that efficiency calls for concentration of effort and authority.

Tuberculosis is a communicable disease and its regulation in a city should be absolutely within the domain of the health department. The problem of this, as well as other diseases, is, however, so interwoven with other conditions as to necessitate additional arrangements by which the health department may be a factor in the final decision of all municipal problems directly or indirectly affecting health.

Under this heading should be mentioned the following: (1) hygiene of streets and alleys; (2) freedom of air from smoke and dust; (3) extent of vacant space, including parks, playgrounds and space between buildings; (4) the health requirements in the architectural arrangements of homes, public buildings, schools and working places; (5) systematic supervision of health of school children.

The direct regulation of the disease itself, in the light of present experience, calls for: (1) notification of all cases of tuberculosis; (2) disinfection and renovation of infected premises; (3) dispensary control of all cases in their homes; (4) institutional provision including hospitals, sanatoria and open air schools; (5) a campaign of education on prevention of the disease.

It is apparent that the control of the entire tuberculosis situation, because of the communicable character of the disease and in the interest of efficiency, should be vested in a city in its health department, with sufficient funds and machinery to control the situation.

The Participation of City Health Departments in the Control of General Conditions Responsible for Prevalence of Tuberculosis.

It is apparent that the city tuberculosis problem can never be solved without the gradual eradication of all such general factors in the city environment which undermine resistance and favor infection.

Pollution of air, cleanliness of streets and alleys, hygiene of public places and conveyances, adequate provision

of light and air in buildings, overcrowding, school environment—all these factors are at present, in nearly all cities of this country, almost totally outside of even partial control by health departments.

Grave considerations of communal welfare demand an arrangement by which municipal health officers may not only exercise a controlling influence over the health requirements in the solution of all the above problems, but also have a well defined right of initiative in the suppression of conditions contributing to the prevalence of the disease.

It is apparent that with further enlightenment on all matters of health the authority of health officers in such matters will materially increase.

Efficient control of tuberculosis by city health departments necessitates the exercise of such authority.

Supervision of Health of School Children.

Supervision of health of school children is naturally one of the most important factors in the municipal control of tuberculosis. Two important features of this problem are engaging the attention all over the country; efficiency calls for their gradual solution.

One is the division of responsibility, at present in existence in many cities of this country, in the matter of systematic supervision of health of school children, with the view of control of communicable disease and advancement of higher health standards. The control of hygiene of school buildings is inseparably linked with this important function. Considerations of efficiency demand centralization of authority, either under a special bureau, with equal representation of the board of education and the municipal department of health, or, the authority should be absolutely vested in the health department.

Another important feature of the present situation is the lack of system and the inadequacy of the medical examinations of school children as conducted at present. The control of the standard of health of school children demands a system of thorough medical examinations, before entrance and at beginning of each school year, as well as a system of subsequent close supervision coupled with periodic reëxaminations.

Centralization of authority and greater efficiency of the present system of supervision are the two important problems to be solved in order to make the present system of school health work an important factor in the gradual eradication of tuberculosis.

Compulsary Notification of Cases of Tuberculosis.

Following the initiative of Dr. Hermann M. Biggs in establishing compulsary notification of tuberculosis cases in New York, the policy has been adopted and is in force in a number of cities of this country, with a variable degree of success, the proportion of living cases reported ranging at present from up to 90 per cent. of reported deaths to 80 per cent. of total number of living active cases (Manhattan).

Enforcement of ordinances requiring notification has, however, only an educational influence unless it is connected with efficient supervision and control of all cases so reported. The work falls within the province of tuberculosis bureaus of city health departments.

Disinfection of Infected Premises.

The object of disinfection is the destruction of all the infective material on premises formerly occupied by a case of communicable disease. This function is inherently within the domain of the health department. At best it is performed at present, in the vast majority of municipalities, in an incomplete way, with the results short of the object sought.

Actual elimination of infective material from premises calls for efficient disinfection coupled with thorough vigilance and thorough coöperation between the health department, the medical profession, the landlord and the general public. It requires sufficient funds for efficient work.

The municipal tuberculosis dispensary system, with its corps of physicians and nurses, is an important factor in the situation.

As in all matters pertaining to the control of tuberculosis, unification of effort is of vast importance.

Dispensary Control of Tuberculosis Cases.

The tuberculosis dispensary system, developed in this country, under the leadership of the National Association for the Study and Prevention of Tuberculosis, is at present one of the greatest factors in the control of tuberculosis in various communities. The American dispensary system, as it stands at present, is noteworthy for its gradual extension of control over the entire environment of the consumptive, including his family and all contacts.

The immense system at present in operation, has grown out of the effort of private anti-tuberculosis organizations. The tendency of the last few years has been toward gradual assumption of this function by state and municipal health departments where it rightfully belongs. We are now in a transitory period, impeded on one hand by the unwillingness of less enlightened communities to assume municipal control, and confronted on the other hand with the lack of system and centralization of effort due to dual or multiple management.

Municipalization of the entire tuberculosis dispensary system in every city, with further development of all arrangements for early diagnosis and efficient control, is of utmost importance to the gradual eradication of tuberculosis in our communities.

Institutional Provision for the Care of Tuberculosis in Municipalities.

The hospital system, for the treatment of advanced cases, has grown in this country out of the initiative of religious and private charity organizations. Most of the county tuberculosis institutional provision developed as a part of the county infirmary or poorhouse system. On the other hand, in the last thirty years, since the

foundation of the Adirondack Cottage Sanatorium by Dr. Edward L. Trudeau, a rapidly growing sanatorium system came into existence, partially under private, partially under state, county or city auspices, chiefly for the treatment of curable cases.

With the recognition of importance of tuberculosis in children, came preventoria, still in their incipiency.

Inadequacy of the existing institutional provision to meet the requirements of the situation is intensely felt even in the most progressive communities. Poorhouse methods still characterize the work of most of the county institutions, the spirit of leadership and tendency to progress being still limited to private sanatoria and hospitals or to a comparatively small number of state, county and city institutions built or developed in the course of the national anti-tuberculosis campaign of the last two or three decades.

Among the most palpable defects of the present institutional provision in most of the communities are the following: (1) lack of cohesion between the work of various institutions in the admission, care and after-care of their patients; (2) lack of coöperation between the hospital, sanatorium and dispensary systems; (3) lack of coöperation between the institutions and the health department in whom is vested the function of controlling communicable disease.

This disassociation of effort is a great impediment to efficient control of tuberculosis.

It is apparent that in cities with sufficiently large population, the health department must have complete control of the entire hospital, sanatorium and dispensary provision, with an additional arrangement in operation, by which all private institutions should become a coöperative factor in a unified and centralized system having for its object control and prevention of the disease.

It is very important that with this centralization of effort in the municipal health department, progress shall continue along lines of medical and administrative efficiency, unhampered by outside considerations.

Campaign of Education on Prevention of Disease.

Health standards are largely a matter of education. Efficient administrative arrangements for prevention and control of disease are impossible without recognition on the part of the community of the importance of the problem, of its causative factors, its relation to general welfare and its methods of prevention. Efficient control of disease cannot be attained without full coöperation of all elements in the community. The personal attitude of every citizen, in the matters of health, is of tremendous importance in the attainment of higher communal health standards and in the efficient enforcement of all regulations enacted with that point in view.

In the last two decades, an educational campaign on tuberculosis and the factors involved in its causation and prevention has been persistently carried on, chiefly by private anti-tuberculosis organizations. The country at large, no doubt, has more in-

formation concerning tuberculosis than any other disease. The information, however, is still rudimentary and is interwoven with a mass of misconceptions.

The lessons taught are frequently at variance with the attitude of the general practitioner and the policy pursued by local health departments. There is a great need of further spread of exact knowledge and adjustment of views by well directed methods of discussion and publicity.

The leadership in a widespread rational and effective educational campaign on tuberculosis must eventually be vested in health departments backed by enlightened medical profession and the people at large. The lesson must be carried to the people by means of all well tried methods including lectures, conferences, exhibits, etc.

Conclusion.

In the further development of the present arrangement for the control of tuberculosis, municipal health departments must gather strength, be given funds and acquire the support of the medical profession and the people at large, in directing a campaign against this most widespread disease of modern times. Efficiency calls for united effort with centralization of authority. The spirit that made possible the country-wide effort of private organizations must finally find its expression in the enthusiastic support given to modern health departments in full accord with their enlightened communities.

INCREASING ORGANIC DISEASE—THE NEW PUBLIC HEALTH PROBLEM.

MR. E. E. RITTENHOUSE,
President Life Extension Institute. New York, N. Y.

Read before the General Session of the American Public Health Association, Rochester, N. Y. September 9, 1915.

WHAT we have to say here upon this subject of increasing organic disease will be of service to humanity only to the extent to which it encourages corrective action. My remarks will be in the form of an appeal for such action.

With this thought in mind let us take the shortest and simplest road to some of the important facts and fundamentals underlying this problem. Let us briefly consider the magnitude and significance of this heavy drain upon national vitality and the means of checking it.

MAGNITUDE OF THE LOSS.

Since the great war commenced a year ago, America has spent eighty million dollars to succor Belgium—a glorious charity. During the same year over 400,000 American adults died from the preventable or deferable diseases of the heart, arteries and kidneys, including apoplexy,—an inglorious sacrifice to ignorance and neglect.

Virtually all of these annual deaths are premature, as we well know, for they can be deferred by a proper observance of the fundamental laws of individual hygiene, and by adopting the habit of calling occasionally upon medical science for physical inspections for the purpose of detecting trouble in its incipiency, or when it will still respond to corrective measures.

It is safe to say that there are constantly at least 15,000,000 adults in America who have one or more of these organic diseases in some stage of development.

The period of development from the incipient to the serious stage of this class of diseases may range from weeks to years, during which time they may be detected by occasional physical examinations and checked or cured if given proper attention. The most of these 15,000,000 people are drifting into these slowly developing and deferable organic diseases unknowingly. The state neither informs them nor warns them. It is not interested in them.

And there is the question of human suffering and economic waste. It is impossible for us to visualize the 15,000,000 people who are, through ignorance or neglect, drifting into organic disease. Nor can we bring within our mental grasp a picture of the extraordinary total of suffering, sorrow, poverty, immorality, and financial loss caused by this needless sickness and premature death—but it is constantly going on, nevertheless.

THE STATE AND PHILANTHROPY.

Americans are extremely generous in relieving distress from acute causes such as accidents, floods, earthquakes, epidemics and wars. And, if these

400,000 funerals with their millions of mourners occurred at one time, and could be visualized and pictured and described in the newspapers, educational funds to combat this enemy would be forthcoming in abundance.

But with all our fabulous riches, with all our wealth of scientific knowledge, with all the noble and charitable impulses of our people which prompt them to shower millions upon the unfortunate *after* trouble comes, we permit this enemy to ravish the nation unchecked.

Go to the philanthropist or the state and ask for advice in fighting organic disease and in effect the answer will be:

"We can do nothing for you. Wait till you are sick, then we will take care of you. We are maintaining hospitals for this purpose. We will even bury you, and send your children to an orphan asylum. We are very charitable, but we will guard you against illiteracy, accidents, and communicable disease only. Organic disease is an act of God."

Some Fundamentals.

For the consideration of those who are not in accord with the idea that the public health service should engage in this educational work, let us refer to a few fundamentals.

It is axiomatic that the primary purpose of organized society is to protect the lives of those who compose it. Hence, if it is a proper function of the state to protect a citizen from germ diseases, why not from degenerative diseases? If it is right to spend public money to guard against disease that may spread and injure the health of the community, why is it not right to guard against disease that is reducing the vitality of the nation?

The state now denies the citizen the privilege of killing his neighbor through ignorance or neglect of health precautions, but concedes him the privilege of killing himself by the very same method. In other words, the state goes to a great deal of expense to save a man from one disease to let him die prematurely from another without the slightest help or warning.

Is a life saved from typhoid fever of any more value to the state and to the family than a life saved from Bright's disease? Is it possible that it is right for the state to teach a citizen how to keep his premises in a hygienic condition, and wrong for it to teach him how to keep his body and its organs in a healthful condition?

There is little to be gained by extending the *extreme* span of life, but it is of vital importance to our country and to posterity that we at least check the shortening of the active, productive period of life.

Must we back away from this great problem of life-saving and of race protection because it is difficult, and continue to drift along the line of least resistance?

That is not the American way. This new burden has been placed upon us by the development of modern civilization and we must not shrink from it.

If the human wastage from this enemy were stationary or even declining, it would still be the imperative duty of American lawmakers, educators, doctors, health officials and the

press to make our people see this picture and to apply relief. How much greater, then, is the need for action when we consider the extraordinary increase which has occurred in the death-rate from organic diseases?

The Menace of the Increase.

The increasing waste of American vitality and life from degenerative diseases among wage-earners and other classes is rapidly reaching the magnitude of a national menace.

Certain members of the medical profession have for years believed that these diseases were increasing. But whether or not they were increasing out of proportion to the gain in population could only be determined by a thorough, tedious and somewhat expensive search and study of our confusing mortality records of former years, for comparison with the more complete data but still limited area of the present. Few have had the time or the inclination to undertake this task. It was done, however, and, with all allowances for inaccuracies, the result can be summed up in the statement that wherever comparisons can be had to cover a period of ten years or more, the crude records show a marked increase in the mortality from the organic diseases, and, as is well known, a decrease in the mortality from communicable diseases.

Time forbids any extended reference to statistics or a discussion of their reliability or the methods of arriving at the ratios. We may, however, consider some comparisons in tabloid form which have been worked out from the most reliable mortality data available. Please remember that these are presented, not to fix in the mind any arbitrary ratio as being mathematically certain, because such exactness is impossible in mortality statistics, but to indicate the trend, and to show how completely the records support the statement that an extraordinary increase has occurred in the mortality resulting from the giving out of the organs.

And also please consider this: By combining the mortality from the degenerative diseases, disturbances of the ratios by improvement in diagnosis or classification are obviated for such change and would not be apt to take them out of this group. Any advance in completeness or accuracy would be naturally too slight in the short period of the past ten years to account for the extraordinary increase indicated by the returns.

The U. S. Census records show that during a period of ten years in a group of occupied males numbering over 4,000,000, the increase in the death-rate from the degenerative diseases was 52 per cent. divided as follows:

	Increase, per cent.
Laboring and servant class	37
Manufacturing and mechanical industries	54
Agricultural, transportation and other outdoor workers	66

During the last census interval, 1900–1910, the death-rate among the general population from organic heart and circulatory diseases, kidneys, and apoplexy increased in eight registration states and cities as follows:

	Increase, per cent.
Maine	28
Massachusetts	20
Connecticut	23
New Hampshire	30
New York	19
New Jersey	17
Michigan	38
Vermont	35
Chicago	45
Cleveland	37
Milwaukee	30
Philadelphia	20
Cincinnati	43
New Orleans	24
Pittsburgh	53
St. Louis	30

These increases range all the way from 17 per cent. to 38 per cent. in the states and from 20 per cent. to 53 per cent. in the cities in the short period of ten years. They are confined to no particular section, race or condition.

In twenty years, 1890–1910, the increase (all ages) in the registration area was 41 per cent. divided as follows:

	Increase, per cent.
Heart and circulatory	46
Kidneys and urinary	50
Apoplexy and nervous system	32

In 1880 there were but two states and sixteen cities where the mortality records were sufficiently complete and reliable to be accepted by the national government. The states were New Jersey and Massachusetts and really constituted the so-called registration area at that time.

The indicated increase in thirty years, 1880–1910, in the death-rate from the heart, kidneys and apoplexy in sixteen American cities, and in New Jersey and Massachusetts (with paralysis, liver and circulatory diseases added in the latter) was as follows:

	Increase, per cent.
Sixteen cities	94
New Jersey	108
Massachusetts	86

It is a significant fact that the mortality from these diseases in England and Wales, Sweden, and other hygienically advanced nations has been either stationary or declined during these three decades.

In the general population in New York City, Doctor Guilfoy's comparison of a thirty year period shows a marked decline in the expectancy of life commencing with the group age 40–50.

Another interesting bit of evidence is found in the record of rejections of applicants for life insurance by a large American company. Out of 20,336 rejections, 8,782 or 43 per cent. were declined for physical impairments indicating the presence or the coming of these same degenerative diseases. This is especially significant in view of the fact that fully 90 per cent. of these 8,782 people were unaware of their condition and under the impression that they were physically sound.

The physical examination of a large number of individuals during the past year by the Life Extension Institute fully sustains the verdict of the general mortality records as to degenerative tendencies. These investigations have given new emphasis to the fact that the foundations of degenerative diseases are laid by a vast number of

people in the early years of their lives, and that these conditions are discoverable long before the individual knows of their existence.

To Sum Up.

To sum up, the best available evidence shows that American life waste from the degenerative diseases is excessive; that it is increasing rapidly, both in city and in rural population, and among the native and foreign born elements; that it is increasing in the younger age groups, but in greater ratio in middle life and old age; that this increased mortality has caused an increase in the general death-rate commencing with age group 40–50, and that these increases do not occur in kindred nations in Europe. In short, American vitality appears to be declining.

In view of the evidence may we not well consider these questions:

Warships, guns, forts and munitions for national defense are now subjects of serious public concern, and properly so. But is it not time to give thought to the physical efficiency of the men who are to handle these defensive weapons now and in the future?

How much longer may we hope successfully to meet the struggles of peace and war with the proportion of inactive, flabby-muscled, low-powered Americans constantly increasing?

How long can the nation endure with the physical fitness of its producers and defenders steadily declining?

The Cause.

However opinions may differ as to the cause or causes of these conditions, we now know that we cannot brush this problem aside by the simple process of assuming that the statistics are valueless, or that the saving of life from infancy to the early adult period from germ diseases has given us an increased number of weakened lives which may become easy victims of the chronic diseases in middle life and old age. Undoubtedly, this influence will affect the death-rate in the older ages in the course of time, but its present effect must be very slight, for the heavy reduction in mortality in early life has occurred almost wholly since we learned of germs and how to fight them, which is within the past three decades. Therefore, very few of these people are old enough to pass into the age group 40–50 and beyond. Again, it should be remembered that, while the same reduction in mortality from the germ diseases has occurred in the European countries, no corresponding increase in the degenerative diseases or in the general death-rate in middle life or old age has occurred there.

It is possible that some specific predominating cause will be discovered—perhaps among our numerous microscopic enemies—for the downward tendency of the American vitality curve.

The most common and plausible reason offered for this trend is found, however, in the statement that the changes in living conditions during the past two generations have been so rapid and so extraordinary that we have not yet had time to adjust our lives to them. We know that these changes have been much more radical and abrupt here than in Europe. It is

a matter of common knowledge that the high nervous tension under which Americans work and live is virtually unknown in other countries. There is also significance in the fact that during the past fifty years the proportion of our population which has changed from an outdoor to an indoor life, or from a physically active to a physically inactive life, has enormously increased. This has been caused by the marvelous gain in our wealth, in time-saving and labor-saving devices and in cheap transportation. With all this has also come a change in the nature and richness of our food.

There are millions of Americans who are living physically unbalanced lives as a result of these changes, to whose aid preventive medicine must come.

But aside from the cause of the increase in this life waste, the vital fact before us is that we now actually know of the habits of life which place excessive strain upon the heart, arteries and kidneys and cause them to wear out too soon.

Stimulating Interest.

And knowing this, is it not our imperative duty to bring this knowledge to the individual and to use our utmost endeavors to induce him to change these habits which are reducing physical efficiency and shortening the active, useful years of life? This being a national problem, the duty of leading in this great educational movement rests with the men of the public health service—local, state and national—who have been entrusted with national health defense.

The health service has already had marked success in spreading knowledge of individual and household hygiene as related to communicable disease. Think of the impetus that would be given to this broader movement, to include organic disease, if every health official in the country were doing his part to stimulate and educate the public upon this subject. We know that this can be done, if we develop a little crusading spirit and set about it.

The reason I feel so positive that this can be done is because of my own experience in helping to arouse interest in the increase of organic disease. A brief account of this experience may be of value for the encouragement of recruits to this health and life-saving cause, and it is therefore given with the hope that the personal reference may be pardoned.

This apparent increase in the degenerative diseases first came to my notice several years ago through my present colleague, Dr. Eugene L. Fisk. He was then medical director of the life insurance company of which I was president, and had already become interested in the subject. The importance of this *increasing* menace to national vitality impressed me deeply, and I determined to enlist permanently in the work of helping to secure public recognition of the seriousness of the problem.

At that time this adverse trend was quite generally ignored. So far as could be learned, no effort was being made to impress the professional world and the public with its significance and the urgent need for remedial action.

We searched and interpreted the

records. The results were given to the public through the press and by other methods. This work has since come to be very much broadened. Gradually help began to come. Slowly but surely professional writers and leaders in the general field of prophylaxis began publicly to discuss the subject in some of its phases. And now, thanks to this growing interest and help, the importance of the *increase* of degenerative diseases is in a fair way to be generally recognized as a problem of national concern.

In 1909 we established in the same company the first health bureau in a life insurance company for the purpose of giving free medical examinations and hygienic knowledge to policyholders, and with most gratifying results in the mortality rate of the group taking the service. At the same time the Metropolitan Life Insurance Company engaged on a large scale in another phase of health conservation, and has since included free examinations to a portion of its policyholders.

While insurance companies move slowly in such matters, their general concern in health conservation has increased, and a number of them, perhaps eight or ten, are now giving free medical examinations to certain groups of policyholders, and others are occasionally issuing educational literature.

Out of the growth of interest in this general subject developed the sentiment that found concrete expression in the organization of the Life Extension Institute. This was done not by the insurance companies, as many suppose, but by Mr. Harold A. Ley and his friends, with the enthusiastic and effective support of Professor Irving Fisher who was a prominent and early pioneer in this movement, and also of former President Taft.

It is important that the growth of this campaign to stimulate interest should be known, that those who wish to help may not be deterred by the scepticism of the same type of friends who assured us several years ago that our efforts would be fruitless.

Help from the Health Service.

Now, if this much can be accomplished by the comparatively small group of people engaged in this educational campaign during the past few years, what may we not hope to accomplish during the coming five years, if the public health service—local, state and national—throughout the country joins in the good work?

We know that a few health officers are already moving in this direction. The New York State Health Department has taken up this educational problem and a part of the state traveling exhibit is devoted to degenerative diseases. The New York City Department has examined a number of city employees and is urging the public to adopt the habit of health examinations. It has also taken up organic disease. It would repay any one to read the papers of Doctors Shipley and Emerson of that department upon this subject.

Recently the United States Public Health Service issued a valuable educational pamphlet by Dr. F. E. Smith on exercise and health, in which attention is called to the lowered expectancy of life above age 40 and to the need of

combating the increasing diseases of degeneration.

There are, doubtless, other departments working in this field of which I am not informed. I know that Doctor Rankin of North Carolina, Doctor Woodward of Washington, D. C., Doctor Hurty of Indiana, and a number of other health officers are deeply interested and have given it attention. I am sorry I cannot recall the names of each of them. The wonderful achievements of the public health service in combating communicable disease has compelled public confidence. The average health officer has much more influence with the public than he imagines, if he will but exercise it.

We have had two conspicuous instances at these meetings. The Governor of New York said here two nights since:

"I have good hope, now that the problem is clearly recognized, that your efforts to induce the public to observe the rules of personal hygiene and to undergo a periodic medical examination for the detection of these diseases at a curable stage will bear fruit in the near future. I shall personally make every effort to follow moderation in all things."

Secretary Redfield of the President's cabinet, said last night:

"If I am correctly informed, we know what is to be done and how to do it, and we have the organization through which the saving of this pain and of loss can be effected. We lack as yet the vision out of which must come the impulse to do."

It was through public health officials that these prominent leaders have become informed and interested in this subject.

Any health official or physician who does not know the modern rules of individual hygiene can inform himself with a reasonable amount of reading. He can soon learn of the habits of eating, drinking, working, resting, playing, that injure the organs and of those that tend to conserve them. If he will keep these rules before the public as much as possible, he cannot help but make an impression upon the minds and lives of many people.

Things To Do.

For instance, by persistently urging the formation of "hiking" clubs to enable people in sedentary occupations to get natural outdoor exercise at least once a week, "hiking" clubs will soon become the vogue in that community—as I understand they are now in some towns. Why not officially encourage the outdoor habit?

Every health officer knows there should be a course in personal hygiene taught in both the elementary and the higher grades in public schools. Why not advocate this?

Every health officer knows that the public should study and observe the common laws of individual hygiene. He also knows that every citizen should go to his doctor periodically for health examinations as a simple, sane preventive measure. Why then should every health officer not make it his permanent policy to urge the people by bulletins, press articles, lectures, etc., to adopt these very sensible health and life-saving habits? Why

not try it? Are not these endangered lives worth the effort?

Aid can be secured in this new educational work by interesting private physicians, medical societies, civic bodies, social organizations, religious organizations, colleges, public school officials, insurance agents' associations, fraternal insurance orders, charitable and relief societies, moving picture theatres, public service corporations, other employers of men and women, and newspapers and magazines.

Some of these agencies will help distribute hygienic literature, some will assist in securing audiences and even lecturers, and to promote exhibits, health day exercises, etc. In fact, if the health officer will but lead, if he will lay out an educational campaign for the year, and earnestly and patiently push it, he will open up a splendid new field of usefulness and with little cost to the public.

In the work of the Institute, we are constantly sending many people to their doctors, their dentists, their oculists. Therefore, we know from experience, as well as from the history of recent years, that the people will heed hygienic advice. They will learn, but they will not educate themselves; they must be taught. And they must depend largely upon the medical profession and the public health service to lead them from the ignorance and folly which is now costing so many precious lives and threatening the vitality of the nation.

Conclusion.

To quote a few lines recently from the pen of Professor Irving Fisher: "Hygiene has repudiated the outworn doctrine that mortality is fatality and must exact year after year a fixed and inevitable sacrifice. It aims instead to set free human life by applying modern science. A science which has revolutionized every other field of human endeavor is at last revolutionizing the field of health conservation. . . ."

"Thoroughly carried out, individual hygiene implies symmetry, and beauty; it enormously increases our capacity to work, to be happy, and to be useful; it develops, not only the body, but the mind and the heart; it ennobles the man as a whole."

In conclusion, let us paraphrase the famous civic oath of the Athenian youth, and make it refer to health, instead of the city; and let us hope that the time will come when this sentiment is displayed and observed in every school and home in the land.

"We will fight for the ideals and sacred blessings of health, both alone and with many; we will revere and obey the hygienic laws and do our best to incite a like respect and reverence in those above us who are prone to annul or to set them at naught; we will strive unceasingly to quicken the public sense of hygienic duty. Thus, in all these ways, we will transmit this human body not less, but greater, better and more beautiful than it was transmitted to us."

THE MARRIAGE HEALTH CERTIFICATE, A DEEPLY ROOTED SOCIAL PROBLEM.

DR. OSCAR DOWLING,
President Louisiana State Board of Health.

Read before the Public Health Officials Section of the American Public Health Association, Jacksonville, Fla., December 1, 1914.

AS SUGGESTED by the subject, the marriage health certificate, in application under present conditions, implies discussion of a complex problem. It has legal and social aspects and relates in both to the fundamentals of the social order.

The text of the recent decision rendered by the Justices of the Supreme Court of Wisconsin in the case of *Peterson* v. *Widule* is an excellent exposition of the legal phase of the question. You are familiar, no doubt, with the history of the incident. The act was passed in 1913, went into effect January 1, and the test case instituted June, 1914. The act provides that male persons making application for license to marry shall within fifteen days prior to such application be examined as to the existence or non-existence of any venereal disease; that it shall be unlawful for the county clerk to issue a license to any person who fails to file a certificate setting forth that such person is free from acquired venereal disease; this to be determined by physical examination and by the application of the recognized clinical and laboratory tests of scientific search, the certificate to be made by a physician; further, that the examiners shall be duly licensed physicians of at least thirty years of age, and the fee not to exceed three dollars ($3). If applicant be indigent, the county physician is required to make the necessary examination without charge. In the event of a dispute or disagreement as to findings, tests made in the state laboratory of hygiene are required and accepted. If the applicant claims unfairness in examination, he shall be entitled to a hearing before the judge of the county court, without jury. The penalty for issue of license without certificate is imprisonment not less than one year nor more than five years. For any physician who knowingly and wilfully makes a false statement the punishment is the same as for perjury, also that the license of such physician for practice in the state shall be revoked.

The petitioner in the case just decided by the Supreme Court presented himself to four physicians for examination tendering each the statutory fee of three dollars ($3). Each refused, because the fee was not sufficient compensation for the Wassermann test for syphilis which they deemed necessary before signing the certificate. The petitioner renewed his application for a license without a certificate which was refused; he then brought action and was given favorable decision. From this judgment the county clerk appealed. Three justices of the Su-

preme Court concurred in declaring the law valid, two gave dissenting opinions.

The law was held unconstitutional by the trial court because it is an unreasonable restriction upon the inalienable right of marriage; it impairs the inherent right to enjoy life, liberty and pursuit of happiness; it interferes with religious freedom.

Justice Winslow in his decision says, in favor of the law, "some general fundamental propositions which are not open to question may probably be stated. The power of the state to control and regulate by reasonable laws the marriage relations and prevent the contracting of marriage by persons afflicted with loathsome or hereditary diseases which are liable to be transmitted to the spouse, or inherited by the offspring, or both, must on principle be regarded as undeniable. . . . Society has a right to protect itself from extinction and its members from a fate worse than death."

It may also be assumed that any legislature in the passage of such a law had as its purpose the safe-guarding of marriage and not its prohibition. In reply to the contention that the law interferes with religious liberty, Judge Winslow in his argument states, "We know of no church which desires its ministers to profane the marriage tie by uniting a man afflicted with a loathsome disease to an innocent woman." In concurrence with the opinion expressed as to the constitutionality of the law, Justice Timlin, while not in sympathy with the provisions of the statute, bears witness to its validity in his opinion that "The exercise of all constitutional rights is subject to reasonable legislation to the public interest under the so-called police power of the state. Before the statute in question could be declared invalid on this hypothesis it must appear that the statute was not at all conducive to the preservation of public health, welfare or morals, or that it carried regulations to an unreasonable or unnecessary extent and so as to interfere seriously with constitutional rights." The Judge concedes the power to require a marriage license also power to require of the license reasonable qualifications. He adds, "I cannot imagine how this law can be said to interfere with freedom of worship or liberty of conscience. A notion that marriage was a sacrament, not a civil contract creating a status, once vigorously asserted, has long since passed away."

On the other hand, Judge Marshall in his dissent says, "to marry is a natural right. . . . To regulate natural rights is necessarily limited to safe-guarding those rights. . . . That which conserves is constitutional while that which is so unduly oppressive as to materially impair is unconstitutional. . . . The marriage right is a proper subject for legislative legislation but not for legislative destruction or material impairment. . . . According to all evidence in this case enactment in question means one thing and can not reasonably be said to mean anything else, and all concede that given such meaning, it is unquestionably a destructive interference with the marriage right. . . .

The penal clause seems to be in the class with those found fatally unusual and unduly oppressive." Justice Marshall concludes with this, "An act of the legislature regulating civil conduct establishes public policy within the scope of legislative power; but when the enactment contravenes the higher public policy enshrined in the fundamental law, the latter prevails and the former is not law at all."

One of the main arguments of those opposed to regulations of this character, in Wisconsin and elsewhere, is that the law singles out men about to marry and makes a class of them. So strongly was this urged in Louisiana by the opponents of a bill proposed this spring in the General Assembly that an amendment was brought in including women. The reply to this by Justice Winslow is convincing. In substance he says, "Medical evidence in the case corroborates what we suppose to be common knowledge, namely, that the great majority of women who marry are pure, while a considerable percentage of men have had illicit sexual relations before marriage, and consequently that the number of cases where newly married men transmit a venereal disease to their wives is vastly greater than the number of cases where women transmit the disease to their newly married husbands. . . . The question is not whether in some individual instance there is any perceptible distinction, but whether there are characteristics which in a greater degree persist through the one class than in the other, and which justify the different treatment. That there are such characteristics in the class of unmarried men is as certainly true as it is discreditable to the male sex." It follows that legislation against males alone for the purpose of preventing the transmission of venereal diseases is clearly within the police power of the state and just as clearly is not discriminatory.

Though the act clearly states the applicant shall present a certificate showing freedom from acquired venereal diseases, its opponents urge that tests even for this, form a "destructive interference" with the marriage right. It is claimed and rightly that few physicians—unfortunately very few—are sufficiently familiar with certain tests to apply satisfactorily and many with experience and knowledge are without the office equipment necessary. In addition, a fee of three dollars ($3) is unreasonably small for any laboratory test. It is argued that our knowledge of the prevalence of those diseases in civil life is so inaccurate we have no just ground for insisting that a man submit to the inconveniences and humiliation of an examination. Also that laws which make marriage expensive, difficult, or subject to objectional requirements tend to increase illegitimate relations which in turn tends to the spread of these diseases.

There are some phases of the operation of the law which are legal, yet have a personal—social aspect. One of these, the examination in its relation to the applicant, the physician and the clerk who knows the findings. Men who realize they may be refused a license will, it is claimed, evade the

law; or do their utmost to influence those who are concerned in its execution. Redress, too, in a trial means publicity obnoxious to the applicant and to those associated. Trial by a jury is objectional, but trial by the judge alone is not considered by some due process of law. Lack of "machinery" and the undesirability of delay are obstacles which must be considered.

It will be conceded that the marriage right is a proper subject for legislative regulation, also that the means of regulation should be legitimate and the degree of restraint not unduly oppressive. Do the objections noted place an act of this character beyond the purview of the state? I believe not.

As marriage is an institution absolutely essential to public welfare, it is a necessity to the permanence of the state; it should be protected by the fundamental law. But society, the state, is made up of individuals, and the well-being of the state depends upon the character of the units which make up the sum. While we do not know the exact number of men who walk daily the streets of our cities afflicted with a form of infectious disease which may, or will, be transmitted in the event of marriage, we do know that there are a number. In 1913, 10,625 cases of syphilis alone were reported in New York City. Dr. A. Prince Morrow is quoted by Dr. A. Corbett-Smith (June, 1914, *Journal of State Medicine*) as having estimated including those infected with gonorrhea as well as syphilis, the number to be 200,000. To quote further from figures by Doctor Corbett-Smith, in 1911 in Siberia, the official report of syphilis was 57,360 out of a population of nine and a half millions. In the whole Russian Empire for the same year the number recorded was 1,265,000 cases of syphilis in all its forms. The population of the Empire is given at 167,520,000, thus there were infected 75 per 10,000 of the population of a territory representing one sixth of the land surface of the globe. Accepting the figures of Berlin of incidence (given by Doctor Corbett-Smith) of syphilis, recent and standing cases the average of this disease is 18 (1.57) per thousand of the total population—of the one disease alone.

Reports of the army and navy give us some idea of the prevalence of these diseases; and if, as claimed, they are much less common in civil life, there are still by far too many infected for us to remain quiescent if there are means of prevention at hand.

If we have no accurate figures as to prevalence of these diseases, even less have we a body of definite facts as to their effect. But observation and inference give conclusions which make us pause. You are familiar with recent investigations of causes of insanity, paralysis, blindness, of attempts to trace the physical history of inmates of prisons and homes for the unfortunate. Without complete knowledge, those open to conviction feel assured that the state should no longer fail in its duty to its unborn citizens.

Do you remember reading of a divorce suit recently instituted in which the husband, a physician, pleaded his wife be given her freedom. "I should not have married when I did

six years ago. I knew then I was doomed to become a hopeless paralytic. Within a year of our marriage I was unable to walk about and the young and blooming girl I had married ceased to be a wife and become merely a sick man's nurse. She is strong and beautiful and she should not be hampered with a worthless body like mine. I ask that you set her free." Could there be greater agony? Yes, had there been children, with the possible—probable—inheritance of a weak spine or defective brain.

I think I do not minimize the difficulties of enforcement of a law of this kind. The expense incident to the individual, the state; the lack in many sections of trained men to act as examiners; the publicity involved in failure to pass the examination, and the apathy of county officers already underpaid and (where they work) overworked, are some of the legal obstacles—if I may so term them. But to my mind these are less important than the attitude of the people which is the social aspect. Men feel competent to protect their daughters; they resent interference, and this in spite of the fact that there is little done to safeguard girls from suitors known to be frequenters of the "primrose path"; naturally every prospective wife has faith in her own judgment. The candidate feels that the requirement casts, unduly, suspicion of immorality on him; and without doubt the incompetency of many examiners would result in unnecessary delay, it might be in grave injustice.

Perhaps, more deeply rooted even than these, is the innate reluctance of our people to discuss frankly sex questions, or to reflect that there is an obligation due the unborn. Knowledge of the most elemental principles of sex relations and danger from transmissable diseases, venereal and others, is not thought of as imperative in the instruction given young people. Fathers, mothers, teachers and physicians alike shrink from the rôle of instructor in this subject so vital to the welfare of the boy and girl, young man and young woman, the community, the state, the nation. We shirk mainly for two reasons—one, the custom of the ages has been to let youth discover for itself, often to its own undoing; second, we are doubtful that we can teach as we should.

I regret to acknowledge that men who know better than the layman, men of the medical profession, fail in their duty to the innocent and to society. In common with many physicians, I have personal knowledge of the sorrow and suffering that has followed in the wake of marriages which should never have been sanctioned. Two instances of recent date occur to me. A young man after months of waiting gained from his physician reluctant consent to his marriage. It was consummated and his wife, three times within five years, has suffered severe operations. She is a mutilated, unhappy wreck. I know another case, which in effect upon the woman was even worse, and this man was a physician himself. Hundreds of instances could be cited where the doctor from a spirit of mistaken kindness, or lack of firmness, became responsible for the mistake. Gener-

ally a man who is sufficiently conscientious to go for treatment, who asks advice, will, if the physician be insistent and steadfast, obey directions. I think it cannot be too strongly urged that there should be no compromise on the part of the medical adviser. He, more than any one, can realize beforehand the certainty of misery as a consequence. Physicians have here a great opportunity to raise the standard of honor and justice toward women; they have opportunity to teach the layman as no one else can teach, and it is to them, both as professional men and as individual members of the community, that society must look for gradual introduction of the proper regulation of marriage.

While I have dwelt on venereal diseases as important in this connection, I do not wish to be understood as believing that they alone should be considered. I recognize that at present our knowledge of effect of other diseases is of such character that it does not carry conviction to the lay mind—in fact, what we have on the venereal diseases is doubted by many, but in time, with others who hope for a day of ideal health conditions, I feel that the state will require much more than freedom from just one class of physical ills.

An intelligent presentation of the legal, socio-legal, and purely social phases of this subject would involve discussion of many fundamental aspects of our social order. I have, therefore, given only suggestions as to its complexity and its relation to established customs and modes of thought. Like all other desired changes in civic life, it will come only when an intelligent, enlightened public makes the demand, and as public conviction is wrought only through education, it is to this we should turn our attention. The operation of these laws in Wisconsin and other states will be followed with interest. Experience in the application, mistakes, failures and successes will be a means of dissemination of information, and will be an aid to legislators and health officers of other states who are willing to submit to the adverse criticisms incident to the establishment of similar regulations.

In looking forward to the era of regulation of marriage when science will give positive data as to the fit and the unfit, and the state will put forth its strong arm for race betterment, I am not unaware of the deeply rooted opposition which must be conquered, nor of the fundamental changes in the social mind which must be brought about; neither do I hope that this may come quickly. But a retrospect of the past gives us courage to stand steadfast for whatever may mean ultimate good for the individual and society and even in the dim light of present knowledge daily growing stronger and brighter, we know that inevitably control and direction of public health will be acknowledged the most vital function of the state.

Discussion.

Doctor Ruehland (*Milwaukee*): My only excuse for taking up the Section's time at this moment is that I have come from the state of Wisconsin, which has been quoted in connection with this eugenic law, and I am for that reason in position to state something of the effect this law has had with us. Not only have I followed its effect as a health official, but I have been brought closely in connection with this particular litigation, inasmuch as I was retained by the state as one of their witnesses, on the technical side of the laboratory tests which have been asked for. Now that we have this law and have it sustained by the courts, it is the opinion of everyone, the profession as well as the courts, that it is an exceedingly badly drawn law. Everyone will admit the desirability of some regulation, but everyone felt that the wording of this law was exceedingly poor, not only because it is class legislation directed against men only, but also because it asked for a form of examination which, under the provision for compensation made could not be performed, with the consequence that at the present time no one regards those qualifications of laboratory tests, even before legal opinion was had as to whether a Wassermann test or a compensation test should be made; physicians disregarded it generally because they said it is an impossibility and we will not make such examinations at a stipulated fee of $3.00. That is a practical point and it is on practical points that these questions will be decided. It would seem that a law calling for protection on the ground of eugenics should not confine itself purely to the venereal problem. There seems to be no reason why a tuberculosis history, why a history of epilepsy or astigmata of whatever nature should not be brought within the scope of this question and be dealt with likewise if we are going to protect ourselves against an unfortunate progeny likely to become a burden upon the community; and in any other state legislation along this line, I think they had better take these things into consideration and word their law broadly enough that it will mean an examination of the marriage candidates by a physician without qualifying just what it shall be, but trusting somewhat to the honesty and honor of the physician that he will act for the best protection of the community.

Dr. W. F. Snow (*New York*): There are 11 states in the United States now that have fragmentary laws that are worse or better, as the case may be, than the Wisconsin law, and there are perhaps 25 other states in which the women's clubs of the state contemplate introducing legislation in this direction this next winter, that is in January. Now there is being held, I think this same week, in Texas, a conference of the State Charities Aid at which health officials and the medical profession are coöperating with the State Charities Aid in a study of the framework for a model law for introduction into that state. I think that is in line with the chairman's statement about the venereal disease problem, that these things that are happening and these determinations in one state after another affecting important groups of citizens—legislation along these lines—makes it necessary that we, as health officers, should study the problem so that we may intelligently either discourage that legislation or direct it into channels on practical lines as the last speaker has indicated. The General Federation of Women's Clubs has three pieces of legislation on this particular subject that they are determined shall become part of the laws of all states; first, the reporting of venereal diseases; second, this health certificate for marriage; and third, the adoption of some such l. w as the Iowa abatement law. Now I wish to point out that this is not an altogether academic problem any longer with health officers. They must be either in a position to direct this force of citizens and debtors, or, if the health officer does not take this up and study it carefully and arrive at his own decisions, he must expect to be set aside as useless to the people, because they mean business in this whole field of the control of social and medical issues of the venereal disease problem.

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CRIPPLING THE HEALTH DEPARTMENT.

The Cincinnati Health Department is facing the necessity of abandoning a number of important services which have hitherto been maintained, on account of a lack of funds, which in turn is due to an unsound system of taxing laws. The budget for the department for the year 1916 is reduced 35 per cent. below the amount allowed in 1915. Here is a noteworthy example of what ought never to have to be recorded in writing the history of an American municipality.

Here is a department which has been conducted with an extremely high degree of efficiency and success and which has been furnishing the people of the city with a protection quite as valuable as that furnished by the police or fire department. The death-rate has been reduced and the city recently had the remarkable experience, for a city of this size, of passing through a week in which there was not a single death from any of the acute infections. It is hoped that Cincinnati may soon appreciate what its health department has accomplished and may take steps to correct the grave mistake which has been made at the earliest possible opportunity.

THE ROCHESTER PATENT MEDICINE CONTROVERSY.

There appeared in the *New York Tribune* for Sunday, September 19, an article by Mr. Samuel Hopkins Adams, entitled "Doctors Hoodwinked by Nostrum Men." Some of the members of the American Public Health Association may have seen this article as the result of an advertisement concerning it which was sent out by the *Tribune*. The Secretary of the Association felt that this article did the Association a grave injustice and he therefore addressed to the editor of the *Tribune* a letter setting forth the facts upon which the article in the *Tribune* was constructed. This letter, which was printed in the *Tribune* on Wednesday, September 29, is printed herewith, in order that any possible misunderstanding

of this affair on the part of members of the American Public Health Association may be removed.

American Public Health Association,
755 Boylston Street.
Boston, Mass., September 21, 1915.

To the Editor of the Tribune.

Sir: The article by Mr. Samuel Hopkins Adams in Sunday's *Tribune* does a grave injustice to the American Public Health Association and the conduct of its recent meetings at Rochester. This article represents that the patent medicine interests were able to insinuate their influence into the proceedings of the Association (despite no fault of omission or commission on the part of the officers of the association—which Mr. Adams admits) so that the members were deprived of hearing a lecture on patent medicines by Dr. O. M. Leiser, of the New York City Department of Health. Mr. Adams specifically states that "through some management or mismanagement" Doctor Leiser's patent medicine arraignment "was eliminated from the American Public Health Association meetings."

Allow me to state that this representation of the situation is absolutely incorrect. Doctor Leiser's paper was not eliminated from the meetings of the American Public Health Association; for the simple reason that it never had a place on the association's program. This paper was originally scheduled on the New York State Sanitary Officers' Association's program, and any responsibility for its being shifted to another date lies elsewhere than with the American Public Health Association.

Possibly Mr. Adams's mistaken idea is a result of Doctor Goldwater's original mistake in addressing Doctor Leary as "Chairman, Arrangement Committee, American Public Health Association." Doctor Leary was chairman of the general committee of the local public health association but had no official connection whatever with the American Public Health Association.

Allow me to say that I am in entire sympathy with Doctor Leiser's paper, and with Mr. Adams's splendid work in fighting the patent medicine fraud. At the same time, in fairness, it should be said that the lecture was given in full and at one of the largest meetings of the entire conference, at a meeting dignified by papers by Surgeon-General W. C. Gorgas and State Health Commissioner Dr. Hermann M. Biggs, and one to which the members of the American Public Health Association had been invited long in advance.

I wish also to make it plain that the 5,000 pamphlets referred to in Mr. Adams's article were not sent to the American Public Health Association and were never offered to the association for distribution to its members.

I trust that you will correct the impression that Doctor Leiser's paper was ever scheduled to appear on the program of the association's meetings or that the patent medicine interests in any manner "hoodwinked" the officers or members of the American Public Health Association. I beg you to give this letter prominence equal to that of Mr. Adams's article.

Respectfully yours,
Selskar M. Gunn.

CERTAIN SANITARY ASPECTS OF CANDY MANUFACTURE.

EARL H. CUMMINS,
Boston, Mass.

THE purpose of this paper was to study the rate of death of different types of bacteria, pathogenic to man, in candy. At the same time special attention has been given to the rate of death of bacteria found in commercial grades of confectionery together with the peculiarities of certain types common to chocolate. The object in studying the rate of death of pathogenic forms has been to find out if certain diseases could be carried by confectionery. This was only possible to determine by inoculating candy of different kinds with each of the pathogenic organisms to be studied and to note the falling off in numbers from day to day. Special attention has been given to the diseases of children, for the reason that candy is looked upon as being a food product consumed in large quantities by children and as a result such disease-producing organisms as B. pertusis and B. diphtheriæ have been studied with considerable detail. At the same time I deemed it wise to study the rate of death of other disease-producing organisms among which may be represented B. typhosus, B. paratyphosus, both A and B, B. choleræ, B. tuberculi, together with the non-pathogenic organsim B. coli. Each of these have been studied in different varieties and in different grades of confectionery with the results that will be found later on in this study.

HISTORY OF THE CONFECTIONERY INDUSTRY.

From time immemorial the human race has regarded the natural products possessing a sweet taste, a delicacy. Even in Biblical times the sweet honey was looked upon as being one of the rare things used as a present (Genesis 43:11). The flowers and bees were then the candy factories and there was no need of sanitary control—when the people found that certain plants possessed juice rich in sugar the history of the candy industry began and then sanitary regulations became necessary for the proper manufacture of sweet products. The Romans were very proficient in the making of fancy sweets and along the Appian Way many booths were erected to dispense the sweet products to the traveling public. Caesar in his miscellaneous writings alludes to the children's desire for coins with which to purchase the sweetmeats so desirable to their tastes. Cicero in his writings alludes to "the filth and reeking sickness" hidden in these sweet products and it can be accredited to Cicero to first see the need for some control of the manufacture of such products, for he says "seek out those doing harm and put punishment on their heads." When we stop and think that such an agitation was inherent in Cicero, it is hard to understand how so little has been

done for the confectionery business, until the confectionery manufacturers themselves saw the importance of their industry a few years ago and began big revolutionary changes.

Review of Literature.

A great deal has been written on sanitary food products and many methods have been devised for testing the cleanliness of foods. It appears strange that so little attention has been paid to the subject of confectionery by the general public until recently. When one stops to consider the vast amount of confectionery consumed in a single year it is surprising that such a branch of the food industry has been entirely overlooked. Yet this is not to be entirely wondered at, for only recently has confectionery been looked upon as a real food product. Heretofore it was always looked upon as being a luxury, hence the fact that so little attention has been paid to the sanitary conditions existing in the manufacturing and handling of confectionery.

Nearly all books on the examination of food products contain a short chapter on the examination of confectionery. In nearly every case this chapter deals with the chemical examination for the presence of certain injurious substances formerly present, in many cases, in confectionery. In no instance have I been able to find a chapter dealing with the sanitary side of the question. In the book by Jago on "Bread Making" there is to be found a very good chapter dealing entirely with the examination of raw materials that go to make up confectionery. This deals with the detection of impurities in glucose, with the detection of certain undesirable coloring materials and with the detection of certain poisons liable to be present.

Prescott seems to be the first to give any data on the sanitary side of the confectionery problem. This first reference to sanitation and hygiene in the candy industry was a paper presented at the Thirtieth Annual Convention of the National Confectioners' Association held in Cleveland, Ohio, in June 1913. In this paper he deals largely with the possibilities of infection and states in a general way that all of the sanitary measures taken in other industries should be as properly applied to the confectionery business.

Reference is made to four factors as influencing the sanitary conditions of commercial candy manufacturing. The first of these is the plant itself, in which he deals with general cleanliness of windows, floors, walls, ceilings, character of construction and arrangement, ventilation, light, freedom from dust, cleanliness of machines and all sanitary arrangements. The second is the testing of raw materials in which he mentions the examination as suitable for use of raw materials, for harmful substances and for the presence of undesirable bacteria. Little thought, no doubt, has been given to types of bacteria that are harmful to the consumer of candy, and the entire reference is to undesirable types of bacteria that may be found in commercial candy which will prove detrimental to the manufacturer and the retailer. A further discussion of this will be given at a later

period. The third factor influencing sanitation in the candy industry is the study of operations. To this little attention has been given, although it is hinted that it is an important factor. Certain general suggestions as to the replacement of all hand operations by machine operations are given and the possibility of obtaining an inoculation on the candy of diphtheria, typhoid or tuberculosis is mentioned as may result from the wetting of fingers in the picking up of wrappers. The fourth factor influencing sanitation is the personal hygiene of the operatives. This is closely related to the first division of the plant as a whole, for it is only possible to have personal hygiene of the operative when the plant as a whole is in a sanitary and up-to-date condition.

Olson, in his book entitled "Pure Foods—Their Adulteration, Nutritive Value and Cost," has a chapter on candies in which he deals largely with cocoa and chocolate. The chapter is entirely devoted to the chemical and physiological side of the problem, and no attention whatever is given to the sanitary aspects of the candy industry. He discusses the use of each of the raw materials that make the larger part of confectionery in a very brief manner and leaves the rest for the reader to imagine.

Wanklyn, in a book published in 1874 entitled "Tea, Coffee and Cocoa," deals in a brief manner with the analysis of cocoa and chocolate. These analyses are as good as any other published more recently but are purely chemical.

Whymper, in "Cocoa and Chocolate—Their Chemistry and Manufacture," deals at length on the history, botany and agriculture of cocoa in which he takes up the history and growth of the cocoa industry, the nature of soils necessary for the growth of the plant and its manufacture. An excellent chapter is given on the chemistry of cocoa.

In beginning such a work as to try to find out if confectionery could carry diseases it was my desire to find if there were any epidemics of any diseases supposed to have been caused from confectionery. This fact I have found to be a hard one to settle either way, although it is true that epidemics have never been directly traced to confectionery. Many sporadic cases of typhoid, if the real history of them were known, no doubt would find their beginning in an infected piece of candy.

The National Confectioners' Association of America is very anxious to investigate all cases of sickness supposed to have been caused from eating confectionery, and in a small book published in 1907 entitled "Facts" is given, "A compilation of various newspaper reports on the subject of supposed poisoning by candy and investigations of the circumstances by our Association." In the foreword of this interesting book is found this statement: "The investigation covers every case brought to our notice and extends over a period of twenty years." It is highly gratifying to know that in all this time not one case of actual candy poisoning has been found to exist except where the poison was actually put into the candy by persons bent upon

mischief or murder. Any sickness that has resulted from eating candy has, in every case, been found to have been caused by indiscretions which would have produced similar results in eating any other food product. This Association offers a reward of $100 for evidence sufficient to start prosecution against any dealer using poisons or injurious ingredients in confectionery.

The Importance of the Confectionery Industry.

The importance of the confectionery industry in the United States is best explained by saying that in 1910 there were employed 54,854 people in 1,944 establishments. This gives it a rank of 27 as compared to the employment of operatives. This is even in excess of such large industries as butter and cheese making, smelting and refining of copper, iron and blast furnace working, flour and grist mill products and the petroleum refining. The value of the products was $134,796,000 in 1910 throughout the whole country. This gives it a rank of 38, being in excess of cars and steam railroads, not including operation of railroads, and leather goods. The value added by manufacturing to the product amounts to $53,645,000, giving it a rank of 32. Some people would naturally suppose that a pound of sugar when converted into candy would bring perhaps one of the largest profits made by any industry. The ranking shows that this is not the case, for it only ranks 32, few products ranking lower than this one.

In Massachusetts the industry ranks fifteenth among all the large industries that the state offers. Throughout the entire state are located 117 establishments, of these 62 are owned by individuals, 16 are firms and 39 are incorporated. The number of establishments and their value may best be seen by table I.

The number of wage-earners employed in the factories throughout Massachusetts in 1910 was 5,548. The thirty odd candy manufacturing concerns in Greater Boston represent an investment of approximately ten million dollars. Their yearly production of candy amounts to over one hundred million pounds. These statistics make Boston the leading candy producing center of the world. It is said that there is a dime of local capital invested for each pound of candy produced, figuring on the annual output. The confectionery houses, shown in table II, located in Greater Boston show in a measure the capital and the estimated production in pounds.

These ten companies represent $6,876,900, with an estimated production of 83,800,000 pounds per year. This in a measure shows the necessity for proper control of such a large industry.

TABLE I.

Establishments worth less than $5,000	17
Establishments worth from $5,000 to $20,000	38
Establishments worth from $20,000 to $100,000	34
Establishments worth from $100,000 to $1,000,000	25
Establishments worth over $1,000,000	3

TABLE II.

Name of company.	Capital output.	Estimated production in pounds.
N. E. Confectionery	$1,529,400	32,000,000
Package Confectionery	1,475,000	2,000,000
W. M. Lowney Co	1,000,000	15,000,000
F. H. Roberts	900,000	3,750,000
Boston Confectionery	700,000	5,000,000
H. D. Foss & Co	450,000	2,800,000
W. H. Schrafft & Sons	425,000	10,000,000
Geo. Close Co	175,000	6,000,000
United Candy Co	125,000	5,000,000
C. A. Briggs Co	97,500	2,250,000

Methods of Manufacture.

In such a paper it is impossible to deal with formulæ for making the various kinds of confectionery and with the various methods employed by different establishments.

The most interesting piece of candy made and the one to which I have devoted most of my study is that which has been dipped into chocolate. Three methods are employed in the manufacture of this class of goods. First, fork dipped, whereby the centers are placed in the liquid chocolate and removed by means of a dipping fork. As carried on by some of the manufacturers the center is picked up by the hands and thrown into the liquid coating. Little is gained by removing the then coated piece by means of a fork for, already, if any contamination is going to take place by means of handling, it has been done in placing the piece into the chocolate, so from a sanitary viewpoint little has actually been gained. Very little of the candy consumed is made by this process and I can pass by, having barely alluded to it.

The second method is coating by hand, whereby the piece is removed from the chocolate by hands. This method possesses some marked advantages over the third, namely, machine dipping and also has some disadvantages over the same method. By means of hand dipping a more uniform coat of chocolate may be applied, which in certain pieces possessing fruits liable to ferment, may be a great advantage, for in a piece of candy developing gas when one weak spot is present in the coating, it will break through, spoiling the candy, and no doubt others in the box. This is, as one can see, very objectionable to the maker, for his consumers cannot understand the factors influencing such a happening. The next advantage and in direct line with the one first cited, is that by hand dipping a heavier chocolate may be applied, thus forming a richer coating around the piece. The third advantage, which is an advantage looked for by some people only, is that more fancy turns may be applied to a piece when hand dipped. This only adds to the expense to the consumer and in no way makes a piece of candy better to eat—the thing sought for when buying.

Handling by human hands any food

product always places that product in a dangerous place and may become infected with various disease organisms during such handling. This is one of the disadvantages of manufacturing by this method, although I do not wish to be misunderstood in saying that it is a great danger.

The third method already alluded to consists in coating the center by means of machines. Various types of machines are employed, each with the same viewpoint to be reached. Some machines possess devices that make machine made chocolates resemble very closely the hand made product. The advantages and disadvantages mentioned under hand coating apply in a reverse order to machine manufacture. One big advantage is that the time of dipping a quantity of chocolates is materially shortened by machines, which is beneficial to the consumer, in that candy so made can be sold at a much lower price than other manufactured products. By this method handling is reduced to a minimum.

All these methods have been studied with special reference to the bacteria present before and after coating. This has been done by comparing the chocolate before dipping and after dipping together with a comparison of the bacteria in the centers before dipping and after having been coated. The increase in number in a measure, represents the actual increase of bacteria due to contamination during manufacture. It is a fact that in nearly every instance machine-dipped chocolates show less bacteria than do hand-dipped ones, although the increase of bacteria in hand-dipped chocolates is by no means an appalling factor when one stops to consider the splendid chance that a piece of candy has to become infected by such an operation. Table III on page 1154 illustrates this fact.

From this it can be seen that when chocolates are made by hand methods the number of bacteria may be doubled from what originally was present, whereas when machine methods are employed little or no increase takes place.

Method of Examination.

The method employed for examining chocolate is as follows: A definite weighed amount of the chocolate, discarding the immediate surface of the sample, was placed in sterilized bottles and warm sterile water added to it, the amount of chocolate generally employed varying from 3.5 to 7 grams and often amounts with bigger limits were used. To this was added 100 cubic centimeters of warm sterile water and the mixture was shaken and re-warmed if found necessary to make a complete emulsion of the chocolate with the water. It was then plated in 1 cubic centimeter amounts in Petri dishes fitted with clay tops, either making the next dilution or plating direct as judgment showed. The plates were poured with about 5 cubic centimeters of standard nutrient agar and upon cooling were placed in the 37° incubator. The period of incubation at first employed was forty-eight hours. At the end of this time the plates were counted. Invariably the plates showed large numbers of

organisms of the spreading type which render the plate very hard to count and thus a large number of colonies were unintentionally overlooked. Later on I found that an incubation period of eighteen to twenty-four hours rendered the plate much easier to count and rather free from spreaders. It is sufficient to say here that no correlation seems to exist between 20° and 37° incubations and nothing seems to be gained by a 20° count either on agar or on gelatin. The colonies formed from the bacteria in chocolate, grown as above, are varied in size and shape and grow very rapidly, the first colonies appearing in eight to ten hours after placing in the incubator. From the same dilutions that were employed for plating, gas tubes of dextrose broth and lactose bile were made, in each case, three to five tubes being used. The gas tubes were examined both on the first and second days with the result that I found better results to be given by examination on the second day. At the end of twenty-four hours gas evolution may begin, but it is seldom completed at this time as an additional day seems to be necessary for the proper production of gas. The gas tubes employed were of the small inverted vial type in a test tube. Only a small amount of media was used in each tube. Tubes containing less than 10 per cent. of gas were not called positive and note only was made of them as being under amount. Often less than 5 per cent. of gas would be noticed in tubes and this was entirely discarded.

Table III will illustrate the results of the bacteria present in chocolate at various stages of manufacture. In the tables are also included bacterial examination of certain finished chocolate goods as made by a large chocolate manufacturing company.

The table headed "Bacteriological Examination of Chocolate" shows

TABLE III.

NUMBERS OF BACTERIA EXPRESSED PER GRAM.

		Hand-dipped.	
		Bacteria before coating.	Bacteria after coating.
Chocolate	A	768	1,020
	B	846	1,306
	C	629	1,508
	D	361	413
	E	702	2,011
Center	A	26	39
	B	18	26
	C	31	36
	D	24	53
	E	27	108

TABLE III.—*Continued.*

		Machine-dipped.	
Chocolate	A	810	881
	B	742	733
	C	613	619
	D	901	908
	E	416	396
Center	A	31	29
	B	28	30
	C	25	26
	D	27	27
	E	30	28

results of examination of various brands of chocolate all produced in the same factory. These examinations were conducted as under the chocolate investigation above, using forty-eight hour counts. Numerous examinations were made from different parts of each separate cake, samples being taken from cakes in the original packages as sealed at the manufacturing house.

Table IV illustrates that a single analysis of a cake of chocolate is insufficient to judge as to its character.

From table IV it is evident that no single analysis of chocolate taken from a cake can be said to express the number of bacteria present. Each locality shows a different number and the ratio between these is by no means a constant one, even for the same brand of chocolate. In one instance the number of bacteria present on the top part of the cake may be expressed by 40,000, in another instance by 20,000, while the bottom part of the cake in the first case, may reveal 20,000 and in the second case the number may be doubled. Thus only by a large number of examinations of chocolate from each cake is it possible to arrive at a conclusion as to the number of bacteria really present in the sample under examination.

In view of the two investigations cited in detail above it is rather hard to see where the bacteria present in chocolate really gain their entrance. After fermentation of a bean it undoubtedly contains, or has adhering to the surface, large numbers of bacteria. Upon roasting, the number is enormously reduced and as a result very few are present. The forms that are present, however, are of the spore-bearing type represented by the hay bacillus in its cultural characteristics. The presence of such large numbers of bacteria on the outer part of the cake might point toward the chance of its being an air infection and this undoubtedly is one avenue for the entrance of large numbers of bacteria to chocolate. The chocolate is cooled in pans in a room under forced ventilation and as large volumes of air are necessary for this cooling there is a great additional chance for air infection.

TABLE IV.

SOURCE OF BACTERIA IN CHOCOLATE MANUFACTURING.

Sample No.	Source of sample.	Weight in gms.	Bacteria per gm.	B. coli types.	
				dex.	lac.
1	Arribas from bag	8.0	463	—	—
2	Trinidads from bag	5.5	16,350	—	—
3	Arribas after sorting	6.5	1,030	—	—
4	Trinidads after sorting	7.0	1,286	—	—
5	Arribas after roasting	6.0	20	—	—
6	Trinidads after roasting	5.6	500	—	—
7	Trinidads, cracked	10.0	220	—	—
8	Trinidad, fine shells	10.0	18,000	—	—
9	Arribas, from fanner	10.0	7,500	—	—
10	Arribas, shells after cracking	10.0	6,000	—	—
11	Cocoa butter	5.0	110	—	—
12	Cocoa after pressing out butter	5.0	10,200	—	—
13	Breakfast cocoa liquor	5.0	1,940	—	—
14	Breakfast cocoa	5.0	2,260	—	—
15	1/5 lb. can cocoa	5.0	5,000	—	—
16	Liquor chocolate	5.0	2,280	—	—
17	1/2 lb. cake	9.0	8,333	—	—
	chocolate	13.5	4,880	—	—
18	— sweet liquor	5.0	2,750	—	—
19	Finished sweet liquor from cooling room		2,220	—	—
			9,000	—	—
			1,820	—	—
			1,500	—	—
20	— chocolate	5.0	910	—	—
21	—, cooled on trucks	8.0	540	—	—
		8.0	10,800	—	—
22	— chocolate cooled on floor	10.5	325	—	—
		7.5	1,148	—	—
23	— C. sweet chocolate cooled on floor	12.5	104	—	—
		9.5	153	—	—

EXAMINATION OF RAW MATERIALS.

The following list embraces in a general way some of the raw materials that find extensive use in the manufacture of confectionery: Sugar; glucose, both bleached and unbleached; molasses; chocolate of various grades and various blends obtained by mixing different grades of chocolate with each other and with various amounts of flavor extracts; cocoanut, both raw and dried; oils of various kinds, among which may be mentioned cocoanut oil, cocoa butter, butter itself, and in some instances by the unscrupulous dealers such inferior oils as lard, cotton

TABLE V.

SUMMARY OF RESULTS ON BACTERIOLOGICAL EXAMINATION OF CHOCOLATE.

(Bacteria expressed in numbers per gram.)

Sample.	Top of cake.	Side of cake.	Bottom of cake.	Interior, 2 inches from edge.
Maracaibo	42,000	20,000	44,000	22,000
Columbia	11,000	29,000	22,000	28,000
Eagle	16,000	5,000	44,000	44,000
Extra Premium	70,000	96,000	84,000	58,000
Pure Cocoa	10,000	18,000	20,000	15,000
Star	12,000	18,000	22,000	14,000

Sample.	Interior, 4 inches from edge.	Interior, center of cake.	Average.	Gas formers in .1 gm.	
				Dex. broth	Lac. bile
Maracaibo	36,000	4,000	26,666	absent	absent
Columbia	26,000	16,000	22,000	present	present
Eagle	12,000	58,000	22,166	present	absent
Extra Premium	56,000	82,000	74,333	present	absent
Pure Cocoa	8,000	12,000	13,800	absent	absent
Star	20,000	15,000	16,800	absent	absent

seed and soya bean; fruits of many kinds, the most important being cherries, dried, glaced and preserved, pineapple in the same general forms, apricot, dried and preserved, figs generally in the dried condition, dates dried, citron, orange and lemon peel prepared in the usual ways that these products are known to the market trade, orange as orange pulp; nuts of all kinds—peanuts, almonds, English walnuts, Brazil nuts, filberts, pecans, cashew and pistachio nuts; starch; various gums as tragacanth, arabic, agar agar, gelatin; egg albumen, dextrine, milk and cream—natural, evaporated, condensed and powdered; flavors of all kinds, only a few of which need be mentioned for nearly every conceivable flavoring desirable to the taste is used by confectioners; the most important are vanilla, lemon, orange, peppermint, wintergreen, raspberry, strawberry, maple, coffee, lime, cassia and anise.

These raw materials can be roughly divided into two classes—first, those important from the sanitary and hygienic standpoint and those unimportant from the sanitary and hygienic standpoint. By the first division I would include these raw materials that when infected naturally are detrimental to the confectionery manufacturer, as for instance cherries which are infected with yeasts.

Rate of Death of Typhoid in Chocolate.

The purpose of this work is to show the rate of dying of typhoid inoculated into chocolate made up of water, sugar, chocolate and milk powder all melted together and sterilized at a low degree of heat. In all this work the chocolate remains constant as does also the milk powder, the variables being the amount of sugar and water present. As the water was increased the sugar was decreased, and vice versa. The mixture after sterilization was inoculated with a twenty-four hour culture of B. typhosus (Hopkins) grown at 37° in standard nutrient broth. The chocolate was then molded and samples taken from the cake at various time periods.

Five-gram samples were used and determinations were made in duplicate in all cases. Dilutions of from 1:20 to 1:200,000 were employed at 100 dilution intervals. The five grams of chocolate were dissolved in 100 cubic centimeters of warm sterile water by shaking, cubic centimeters being taken from this and plated directly and also diluted. As far as possible the concentration of the chocolate and sugar was kept as low as possible and results were taken that were obtained by the lowest dilution that could be used and still have a reasonable number of colonies to the plate.

The plates were poured with standard agar immediately after plating and placed in the incubator as soon as cool. The temperature of incubation was 37° for twenty-four hours.

The chocolate when inoculated with the typhoid was stored at approximately 20°C., for the time intervals stated under each test. The percentage of water in each case was kept as close as possible to the amount at the beginning.

TEST NO. 1.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	4.0
Sugar	57.0
Chocolate	31.5
Milk powder	7.5
	100.0

	Per gram.
Initial No.	400,000
After 10 hrs.	365,000
" 20 "	320,000
" 50 "	260,000
" 72 "	205,000
" 108 "	129,000
" 168 "	76,000
" 336 "	50,000
" 772 "	39,000
" 1008 "	56,000
" 3360 "	24,000

The temperature at which this was stored was 20°C. After the end of the run the per cent. of moisture was estimated in the chocolate by drying at 100° to constant weight and was found to be 5 per cent.

TEST NO. 2.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	8.0
Sugar	53.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No.	260,000
After 10 hrs.	248,000
" 24 "	210,000
" 48 "	156,000
" 72 "	116,000
" 100 "	78,000

	Per gram.
After 200 hrs.	40,000
" 300 "	36,000
" 400 "	25,000
" 600 "	18,000
" 700 "	19,500
" 800 "	18,200
" 1000 "	15,000

The per cent. of water present at the end of the run was found to be 6.7 per cent.

TEST NO. 3.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	12.0
Sugar	49.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of typhoid	132,000
After 10 hrs.	125,000
" 24 "	60,000
" 48 "	48,200
" 72 "	33,000
" 100 "	26,000
" 120 "	24,000
" 140 "	19,000
" 160 "	16,000
" 200 "	13,000
" 250 "	13,200
" 300 "	13,100
" 350 "	13,000
" 418 "	12,500
" 500 "	11,900
" 1008 "	8,000
" 1200 "	9,000

The per cent. of water present at the end of the run was 9.6 per cent.

TEST NO. 4.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	21.0
Sugar	40.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of typhoid	180,000
After 10 hrs.	172,000
" 24 "	136,000
" 50 "	27,000
" 100 "	25,000
" 110 "	25,000
" 120 "	24,000
" 148 "	24,000
" 168 "	22,000
" 336 "	18,500
" 504 "	16,000
" 1008 "	14,000
" 1680 "	11,000
" 3360 "	10,000
" 5040 "	6,000

The per cent. of water present at the end of the run was 20.5 per cent.

At the end of each month a small amount of sterilized water was added to the chocolate sufficient to bring the percentage up to 21 per cent., and at no time during the run did the percentage fall below 19 per cent.

TEST NO. 5.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	29.0
Sugar	33.5
Chocolate	30.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of typhoid	200,000
After 10 hrs.	185,000
" 20 "	170,000
" 48 "	15,000
" 72 "	12,000
" 144 "	18,000
" 168 "	21,000
" 336 "	14,500
" 504 "	11,000
" 1008 "	8,000
" 1680 "	33,000
" 3360 "	36,000
" 5040 "	40,000
" 5200 "	26,000
" 5400 "	14,000

This determination is still in progress. The per cent. of water present at the end of 5,040 hours was 30 per cent., the percentage of water being kept up to 20 per cent. by the addition of sterile water each month. Only once was the percentage allowed to run below 25 per cent.

Rate of Death of B. Coli in Chocolate.

The purposes of this work was to show the rate of death of B. coli inoculated into chocolate of the same composition as was used for the work on B. typhosus. The mixture after sterilization was inoculated with a twenty-four hour culture of B. coli grown at 37° in standard nutrient broth 1.5. The chocolate was then molded and samples taken from the cake at various time periods.

The same precautions and dilutions as were described under typhoid were here taken, both as to plating, incubation and storage of inoculated chocolate.

TEST NO. 1.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	4.5
Sugar	57.0
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of B. coli	400,000
After 10 hrs.	375,000
" 30 "	360,000
" 48 "	350,000
" 96 "	240,000
" 168 "	100,000
" 336 "	29,000
" 772 "	168,000
" 1008 "	145,000
" 1680 "	13,000
After 3360 hrs.	25,000
" 5040 "	6,200

The per cent. of water present at the end of 5,040 hours was 5 per cent.

TEST NO. 2.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	8.0
Sugar	53.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of B. coli	200,000
After 10 hrs.	185,000
" 20 "	140,000
" 48 "	100,000
" 72 "	61,000
" 108 "	50,000
" 168 "	26,000
" 336 "	none
" 772 "	1,000
" 960 "	none

The per cent. of water present at the end of the run was 7 per cent.

TEST NO. 3.
ANAYLSIS OF CHOCOLATE.

	Per cent.
Water	12.0
Sugar	49.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of B. coli	140,000
After 10 hrs.	100,000
" 48 "	50,000
" 72 "	18,000
" 108 "	15,000
" 168 "	15,000
" 336 "	18,000
" 772 "	11,000
" 1008 "	8,000

The per cent. of water at the end of the run was 10 per cent.

TEST NO. 4.

ANALYSIS OF CHOCOLATE.

	Per cent.
Water	21.0
Sugar	40.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of B. coli	200,000
After 10 hrs.	180,000
" 24 "	90,000
" 36 "	76,000
" 72 "	14,000
" 108 "	9,000
" 168 "	11,000
" 336 "	8,000
" 1008 "	9,000
" 5040 "	none

The per cent. of water present at the end of the run was 20 per cent.

TEST NO. 5.

ANALYSIS OF CHOCOLATE.

	Per cent.
Water	28.0
Sugar	33.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of B. coli	100,000
After 10 hrs.	190,000
" 24 "	22,000
" 36 "	6,000
" 100 "	12,000
" 126 "	44,000
" 168 "	49,000
" 196 "	4,800
" 336 "	3,000
" 504 "	none

The per cent. of water present at the end of the run was 27 per cent.

Rate of Death of B. Pertussis in Chocolate.

The purpose of this work was to show the rate of death of B. pertussii inoculated into chocolate containing 8 per cent. and 21 per cent. of water, storing at room temperature for a time and taking samples at intervals as shown under experimental data.

The culture used was obtained from The American Museum of Natural History of New York City. The culture was grown at 24°C. on ascitic agar for four days. A loopful of the growth was inoculated into the chocolate, the same precautions regarding plating being here observed as described under typhoid. The plates were poured with ascitic agar and incubated at 20°C. for four to seven days, the count being taken as representing the true number present was the highest obtainable on any one of these days. In some cases I found the highest number to be visible at the end of four days, in others as many as seven days were necessary to obtain the greatest number of colonies. The results of my work on pertussis have been largely to see if a candy maker in a factory infected with the whooping cough bacillus could by any chance produce an infection in the candy which could be transmitted to children.

TEST NO. 1.

ANALYSIS OF CHOCOLATE.

	Per cent.
Water	8.0
Sugar	53.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of pertussii	80,000
After 10 hrs.	760
" 36 "	none

The work was again repeated using shorter time intervals with the following results:

	Per gram.
Initial No. present	100,000
After 1 hr.	86,000
" 3 hrs.	75,000
" 4 "	42,000
" 5 "	10,000
" 6 "	none

TEST NO. 2.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	21.0
Sugar	40.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. of pertussii	60,000
After 1 hr.	48,000
" 2 hrs.	11,000
" 3 "	none
" 4 "	none

Repetition of the above test gave the following results:

	Per gram.
Initial No. present	72,000
After 1 hr.	46,000
" 2 hrs.	20,000
" 3 "	1,000
" 4 "	none

Rate of Death of B. Tuberculi in Chocolate.

The purpose of this work was to show the rate of death of B. tuberculi inoculated into chocolate, storing at room temperature for a time and taking samples as shown under experimental data. The culture used was of the human type obtained from Dr. B. L. Arms in 1913, grown since then on egg albumen medium. At the time of beginning my work a very heavy growth of tuberculi bacilli was present on the surface and two or three loopfuls were used to inoculate into the chocolate. A suitable medium for growing cultures plated has not been found and I consider my work on this organism to be unsatisfactory. Nutrient agar, extract agar, casein agar, egg albumen agar, and ascitic agar have been tried. The best results were obtained by pouring very heavy plates of albumen agar and incubating for a period of time ranging from one to three weeks. Examination of these plates was rather indefinite and only an approximation has been reached. The colonies so developed were by no means regular in form and it was sometimes impossible to tell whether actual colonies formed from tuberculi bacilli were actually present.

TEST NO. 1.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	4.0
Sugar	57.0
Chocolate	31.0
Milk powder	8.0
	100.0

	Per gram.
Initial No. present	6,000
After 1 hr.	1,000
" 2 hrs.	none

TEST NO. 2.
ANALYSIS OF CHOCOLATE.

	Per cent.
Water	8.0
Sugar	53.5
Chocolate	31.0
Milk powder	7.5
	100.0

	Per gram.
Initial No. present	10,000
After 10 min.	8,000
" 20 "	2,000
" 60 "	6,000
" 120 "	none

A repetition of this test gave the following results:

	Per gram.
Initial No. present	8,000
After 10 min.	14,000
" 20 "	11,000
" 30 "	6,000
" 60 "	8,000
" 120 "	4,000
" 180 "	7,000
" 240 "	2,000
" 360 "	none

From the foregoing pages the following conclusions might be arrived at:

First, that the tremendous size of the candy industry warrants careful sanitary control.

Second, that hand-dipped candies run higher in bacteria than do candies coated by machines.

Third, that raw materials, especially chocolate, can be the source of a large amount of bacteria found in candy.

Fourth, that the chance of obtaining an infection of whooping cough as may be caused by B. pertussii, is very remote in chocolate candy. It was found that after a few hours there ceased to be present any trace of the organism.

Fifth, the possibility of obtaining the tubercle bacillus was very slight, although a definite time limit for its survival has not been placed.

Sixth, that even after a long period of storage, it was possible to find the typhoid organism, so the conclusion resulting is that, if typhoid carriers should by chance infect candy, the bacillus could survive a long time and might give rise to infection in an innocent participant.

Seventh, that organisms of the colon type can survive a long time and if inoculated into candy would find their way to the human body through this source.

Eighth, that the rate of death of organisms in candy is in some proportion to the amount of water that the candy has present.

It will be seen that candy with a high water content can kill organisms faster than a candy of low moisture content. This killing may be due to difference of osmotic pressure resulting between bacteria and sugar solutions. But since the organisms continue to exist for a considerable period of time (with typhoid for 5,400 hours—over 7 months), it would rather seem that this killing would be due to the aseptic properties of chocolate.

A continuation of the work mentioned above is under way.

REPORT OF THE COMMITTEE ON CITY WASTES: THE ECONOMICS OF WASTE COLLECTION AND DISPOSAL.

DR. P. M. HALL,
Health Editor, Minneapolis Tribune, Chairman.

Read before the Health Officials Section of the American Public Health Association, Jacksonville, Fla., December 2, 1914.

OFTEN after a city, town, or village has settled the question of the desirability of a system of waste collection and disposal, another, and a very vital question arises—that of providing the necessary funds. There are several ways in which this problem may be met. First, by letting the whole thing to a contractor and allowing him to charge each householder a certain sum, fixed by ordinance for receiving the service. Provision should be made by ordinance compelling every householder and business house to employ the service. If the work is done at all it should all be done. The authority for compulsory collection has been established by two decisions of the supreme court of the United States, one in a case brought from the courts in Detroit, and the other from San Francisco. The decisions set aside the constitutional property rights there may be in garbage for the benefit to the public health.

Another way for a city to pay for the service is out of the funds raised from general taxation. This simplifies the method of securing the necessary money to carry on the work. As mentioned before the service should extend to every citizen.

Sometimes if the funds to be raised by taxation are already large, the service is apt to be curtailed by scant appropriations. Everyone should be compelled to accept the service. You want the whole city clean, not a place here and there. If the city makes its estimates upon the budget system then it is quite certain that the amount to be raised for any system of collection and disposal will always be considered large.

This leads us to the consideration of a method of taxing for this service in much the same way as is done in some cities for the raising of money for street sprinkling. An opinion given by the city attorney of our own city has a bearing directly upon this very important subject. The attorney was asked, "Would it be possible to provide for the handling of garbage, ashes, manure, rubbish, etc., by assessment upon the property? How would such an assessment be levied? Would the funds created and arising from such assessment be separate and apart from the appropriation for current expenses?" In the efforts to keep down the expenses of the departments under Council authority it has been suggested that the money for the collection and disposal of garbage, ashes, rubbish, manure, etc., might be raised outside of the regular levy, and thereby to that extent, at least, afford relief to the

current expense fund. The section under consideration does not seem to be specific with regard to the authority to cover the expense of disposal, although it is apparently plain the authority is conveyed to assess the expense of removal, but no mention is made of "disposal," or are both comprehended in the act of "removing." He replied as follows:

"1. That the charter provision to which you refer distinctly authorizes the Council 'to require and provide for the removal throughout the city or in such districts, or on such streets thereof, as it deems proper' of any and all swill, offal, garbage, ashes, barnyard litter, manure, rubbish, yard clearings, the contents of any privy, vault, cesspool or sink, dead animals, or any other foul or unhealthy stuff or material." I venture to say, in passing, that this enumeration of offensive things, the disposal whereof is contemplated, seems broad enough to embrace noxious weeds and plants which occasion disease.

"2. The duty thus laid upon the Council is accompanied by authority to 'assess the expense of such removal upon the property from which such above named matter or things shall be taken.' Also by power to enter into five-year contracts, if that is deemed advisable, with any person who will engage to perform the service.

"3. The fund arising from such assessments would be distinct from the regular tax levy for current city expenses. Like the special assessment for street sprinkling, the proceeds would be set apart for the one purpose and could be devoted to no other.

"4. It seems to me that this power of assessment is not limited to the charging against each lot of the cost of cleansing the particular lot. The naming of districts or streets to be so cared for implies, I think, that a uniform assessment may be laid upon the area or frontage designated, thus creating a fund out of which the cost of serving the whole district shall be paid. The provision that the whole may be done by contract is inconsistent with the idea of collecting the fund by piecemeal. It is the district that is to be assessed, thus equalizing the charge. Upon that theory vacant lots, no less than such as are occupied, would share the burden. This is true of all other special assessments, the ground of the tax being that the improvement, or the service (sprinkling for example), adds to the value of the property whether occupied or not. Moreover the very condition of vacancy often invites the deposit of offensive matter which should be removed. This suggests a new method of providing money for this very necessary service. With a system of collection and disposal inaugurated the question of doing the work as cheaply as possible and deriving any revenue becomes a question of the evolution of the service."

Garbage.

The possibility of deriving revenue from the use of garbage has ever been an inviting one. The feeding of hogs, the extraction of grease, the development of steam to be utilized, all have their advocates. The sanitary features and the consideration of the public health should always outweigh

any prospect of financial return. Pig-feeding has been made profitable under certain conditions. It is doubtful if the conditions surrounding collection and final feeding are ever without some considerable nuisance. The extraction of the greases and the utilization of the resulting tankage have been considered as profitable ventures. The limitations are the conditions surrounding the can, the lack of plenty of material, and the constantly increasing amount of grease in the garbage. Disposal by fire and the utilization of the developed steam has been carried on extensively in England and to a degree in this country. It has not as yet reached its highest possibilities owing to the lack of opportunity of utilizing the developed steam for the whole 24-hour period. The limitations are governed somewhat by the character of the collected waste, the regulations of household preparation, the opportunities for complete utilization, and the ability to use auxiliary fuel and power.

Ashes.

Ashes may be used profitably for the purposes of filling low lands. Theoretically, it has been shown that there is a considerable of unburned carbon in ashes from hard coal. A number of analyses in our own city showed this to be about 30 per cent. Any value arising from this source is apt to be used in the cost of getting the separation done, in the extra cost of hauling to central points for handling, and in caring for the nuisance occasioned by the operation of sifting. In destructor plants the ashes are used as auxiliary fuel, but unfortunately for successful continuous operation, the ashes are least abundant when they are most needed as fuel to assist in burning. There have been suggestions as to the use of sifted ashes for taking the place of sand for some kinds of concrete work, but nothing practical has come of it.

Rubbish.

Buffalo, Rochester, and other cities have demonstrated that rubbish disposal can be done at profit. The reclaiming of paper, rags, bottles, rubbers, tin cans, and other rubbish has been profitably done.

Manure.

Manure is always worth more than the cost of collecting it for fertilizer. It is sold in many cities for such purposes. The method of securing collections and making the sales are different in different cities. It properly should be returned to the soil and its removal from the cities is going to be demanded in the future on account of the fly nuisance.

Street sweepings, of course, so long as they contain manure should be included in the disposal.

Night-Soil.

Night-soil should be disposed of by the municipality so long as the danger from fly infection is a real one. Attempts have been made in the past to produce fertilizer from it, but with indifferent success. By doing the collecting the city can assure odorless operations and proper disposal. The old out-door closet is rapidly disap-

pearing from our cities. Plumbing is no longer considered as a luxury but a necessity.

The economical collection and disposal of city waste demands a study of all the possibilities of utilization. If the work is assumed as a whole by the city and done well the citizens will support it, but if the service is inefficient the complaints of increased taxes are long and loud. The possibilities of complete efficient collection and disposal we have never seen realized. The demonstration is yet to be made. It is probably more closely approximated in Havana and the Canal Zone than in any other part of the world. In the Canal Zone we have been shown that the service is not expensive. There it was instituted and is carried on as a health measure, and this probably accounts for the efficiency of the service. May we not draw a conclusion from this that the service instituted for the protection of the public. health is apt to be the most efficient and the one that is supported best by the public?

AN IMPROVEMENT IN THE COMPOSITION OF LACTOSE BILE.

THOMAS W. MELIA,
New York, N. Y.

LACTOSE bile, as employed at present, has certain disadvantages:

1st: The bile is not always fresh. This is shown by too great acidity, especially in warm weather, and by the presence of considerable turbidity which will pass through the ordinary laboratory filter.

2d: The media, after sterilization, contains a heavy sediment in the fermentation tubes which interferes with the developments of the test.

3d: Many authors have criticized the inhibiting power of the bile salts upon B. coli.

In regard to the first disadvantage, it is the practice at this laboratory to purchase ox gall from freshly slaughtered animals and by special arrangement have it delivered within a few hours. It is then evaporated to dryness in a vacuum dryer. Twenty gallons of the bile are placed in shallow pans which rest upon shelves heated by steam under 15 pounds pressure. The vacuum is maintained by a Hubbard Electric Pump. The dryer is manufactured by the Buffalo Foundry Company. All bile is tested and none accepted if the acidity is more than +1.5 (Fuller's scale). Twenty gallons require about 12 hours to evaporate and yield about 15 pounds of product. This is scraped out and kept in tight containers. Once dry, ox gall keeps indefinitely. There is considerable saving by evaporation, since loss of breakage of bottles in sterilizing the liquid bile has been quite material. Breakage in transportation to branch laboratories is also avoided. In many cases fresh ox gall is not available to laboratories situated in small towns. Again, by purchasing bile only in the winter and evaporating to dryness we avoid the spoiled article frequently obtained in summer.

The cost of evaporating, including bile, labor and fuel is about $1.50 per pound. One pound of bile is sufficient for four and eight-tenths liters of media (10 per cent. bile), or thirty-three samples of water tested in .1 cc., 1.0 cc. and 10 cc. quantities.

Ordinary commercial brands of bile salts cannot be used in lactose bile media with success, but there is now available desiccated bile of the right quality which may be purchased from William F. Kipp, 69 Barclay Street, New York City.

In regard to the sediment present in the fresh bile and in the sterilized media it was thought that old bile might be furnished in some instances, possibly with some added substance for preservation. Examination of the sediment proved it to be composed of mucin, lime salts and broken gallstones (cholesterine) chiefly, probably formed by streptococcus growth. The bile should be settled and only the clear supernatant liquid used. The

following table No 1 gives the specific gravity and salt content of several deliveries.

The excessive salt present on February 10, 1914, was probably due to careless handling at the slaughterhouse, as salt water is used for flushing purposes. The salt was probably not

The results show quicker gas formation, the production of a larger amount of gas, in higher dilutions, and less interference from streptococcus in the 5 per cent. bile than in the 10 per cent. bile.

Streptococcus produces a heavier growth and more acidity in 10 per

TABLE 1.

1913.	Specific gravity.	Na Cl. ppm.	1914.	Specific gravity.	Na Cl. ppm.
Oct. 7	1.030	10,700	Jan. 6	1.029	10,540
" 14	1.029	10,520	" 13	1.033	11,020
" 21	1.037	10,810	" 20	1.037	10,910
" 28	1.028	9,960	" 27	1.040	11,070
Nov. 12	1.020	9,430	Feb. 3	1.032	10,310
" 18	1.032	10,210	" 10	1.078	288,000
" 24	1.040	11,060	" 17	1.028	10,010
Dec. 9	1.030	10,692	" 24	1.030	10,682
" 16	1.028	9,950	Mar. 3	1.026	10,050
" 23	1.022	9,510	" 10	1.042	12,270

added intentionally since it does not act, even in saturated solution, to kill B. coli or B. typhi. (Sternberg, Bacteriology, page 195.)

In regard to the second disadvantage, the sediment in the fermentation tubes may be prevented by making a 5 per cent. instead of a 10 per cent. bile media. The efficiency of the media will be next discussed.

The known inhibiting power of bile salts led to an investigation of the best strength of bile media to employ. Comparison of 5 and 10 per cent. bile media (1 per cent. lactose and 1 per cent. peptone each) on B. coli pure culture, contaminated water, street washings, milk, sewage, human and horse feces is given in Table 2.

cent. bile than in 5 per cent. The acidity is stronger also in the bulb than in the arm of the fermentation tubes. The precipitate interferes with the development of the bacteria and the gas formation.

Tests were also made to determine the most efficient percentage of bile. Results with 1 per cent., 2 per cent., 2½ per cent. and 3 per cent. dried ox gall are given in Table 3.

As the amount of lactose and peptone (food materials) was alike, the differences must be due to some physiological function of the ox gall. The increase in amount of gas produced in 24 hours, as the amount of bile increases, is very striking. It is also apparent in the 48-hour and 72-hour results. Posi-

TABLE 2.

COMPARISON OF RESULTS OBTAINED BY FIVE PER CENT. AND TEN PER CENT. BILE MEDIA UPON HIGHLY CONTAMINATED SAMPLES.

	Time recording gas. Hours.	Five per cent. bile media. Amount of gas produced in different dilutions.							Time recording gas. Hours.	Ten per cent. bile media. Amount of gas produced in different dilutions.							Positive isolation from high dilutions of B. coli.
		1.0 cc.	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "		1.0 cc.	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "	
Sol. No. 1. B. coli culture from water. 100,000 per cc.	24	30	37	29	26	30	35	0	24	26	20	17	32	20	31	0	+
	48	50	59	48	56	63	70	0	48	37	35	41	48	52	54	0	+
	72	72	67	70	83	63	72	0	72	60	56	48	51	50	58	0	+
Sol. No. 2. Contaminated pond, L. I.	24	42	37	29	40	0	0	0	24	12	22	46	14	0	0	0	+
	48	56	58	70	54	0	0	0	48	46	33	51	29	0	0	0	+
	72	70	69	72	78	0	0	0	72	59	68	72	36	0	0	0	+
Sol. No. 3. Street washings after rain-storm.	24	47	49	53	46	54	52	0	24	12	10	17	23	50	0	0	+
	48	56	70	64	68	64	76	0	48	32	17	28	37	57	0	0	+
	72	61	78	82	69	70	79	0	72	49	67	54	93	72	0	0	+
Sol. No. 4. Contaminated milk from ice cream.	24	14	32	28	16	41	36	54	24	16	28	37	31	30	0	0	+
	48	29	37	31	29	48	42	63	48	29	36	91	46	37	26	0	+
	72	39	93	46	37	48	50	67	72	87	54	91	59	54	41	0	+
Sol. No. 5. Sewage from Queens, L. I.	24	47	51	56	58	71	70	0	24	50	74	32	60	42	37	0	+
	48	82	74	63	68	75	76	0	48	86	82	80	92	48	55	0	+
	72	82	86	72	70	75	78	0	72	86	82	91	92	90	67	0	+
Sol. No. 6. Human feces.	24	60	50	42	37	60	60	70	24	48	50	29	38	46	45	61	+
	48	78	91	86	86	80	78	78	48	63	57	52	53	91	70	66	+
	72	79	90	87	86	89	79	78	72	74	89	85	82	91	78	70	+
Sol. No. 7. Horse feces.	24	22	28	24	26	27	0	0	24	12	8	7	10	6	0	0	+
	48	42	43	51	47	49	16	0	48	33	22	19	31	17	0	0	+
	72	46	44	51	48	49	31	0	72	34	37	29	37	62	0	0	+

tive tests in higher dilutions were also shown with the larger amounts of bile. The results are probably due to prevention of over growths and interfering growths. For example, streptococcus was found in less high dilution with the larger amount of bile. It is interesting to note that B. coli was actually isolated in .00001 cc. although gas was not produced in the 1 per cent. and 2 per cent. media.

Table 4 gives a similar comparison with a mixture of human and horse feces. The results are of the same order. As horse feces contain an abundance of streptococci, the lack of interference is shown with the higher amounts of bile.

It is not advisable to use less than 5 per cent. bile owing to the effect of dilution when planting 10 cc. quantities of water.

TABLE 3.

COMPARISON OF RESULTS OBTAINED BY ONE, TWO, TWO AND ONE-HALF AND THREE PER CENT. BILE MEDIA UPON SEWAGE.

	Time recording gas. Hours.	One per cent. bile media. Amount of gas produced in different dilutions.								Time recording gas. Hours.	Two per cent. bile media. Amount of gas produced in different dilutions.								Tubes showing 20 per cent. or over on gas formation.	
		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "	1%	2%
Sol. No. 1. Sewage	24	8	6	8	7	4	5	0	0	24	10	12	14	10	10	17	0	0	0	0
from L. I.	48	12	19	10	12	7	9	0	0	48	30	37	30	28	28	26	0	0	0	6
	72	20	20	18	22	28	20	0	0	72	37	41	36	28	30	42	0	0	5	6
Isolation of B. coli		+	+	+	+	+	+	+	0		+	+	+	+	+	+	+	0		
Isolation of Strep.		+	+	+	+	+	+	0	0		+	+	+	+	+	+	0	0		

		Two and one-half per cent. bile media. Amount of gas produced in different dilutions.									Three per cent. bile media. Amount of gas produced in different dilutions.									
		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "	2½%	3%
Sol. No. 1. Sewage	24	14	16	10	20	17	27	20	0	24	27	30	33	37	40	36	27	0	3	7
from L. I.	48	36	37	41	59	42	36	39	0	48	46	54	56	53	46	48	42	0	7	7
	72	50	49	53	47	46	51	46	0	72	85	82	77	76	54	79	59	0	7	7
Isolation of B. coli		+	+	+	+	+	+	+	0		+	+	+	+	+	+	+	0		
Isolation of Strep.		+	+	+	+	+	0	0	0		+	+	+	+	+	0	0	0		

As the previous comparisons were made on highly contaminated samples, a series of tests were made comparing the 5 and the 10 per cent. dried ox gall solution on the regular routine water samples from various supplies of the Manhattan and Brooklyn watersheds, and the results are given in Table 5.

Some of these waters are from underground supplies and some from surface ponds, which show the presence of contamination, especially after heavy rain storms, due to their shallowness.

It is apparent that the 5 per cent. solution is much more sensitive and gives higher percentages of B. coli present, as can be seen in Table 5. This is

especially true if the B. coli is in the attenuated state.

Examination of the individual analyses (45 in number) showed that the 5 per cent. media gave a positive test for B. coli one dilution higher than the 10 per cent. media twelve times in the one-day results whereas this occurred only once with the 10 per cent. media. In the two-day results the 5 per cent. media was one dilution higher fifteen times and two dilutions higher six times. The 10 per cent. media was one dilution higher only once. In the three-day results the 5 per cent. media was one dilution higher fifteen times

TABLE 4.

COMPARISON OF RESULTS OBTAINED BY ONE, TWO, TWO AND ONE-HALF AND THREE PER CENT. BILE MEDIA ON A MIXTURE OF HUMAN AND HORSE FECES.

	Time recording gas. Hours.	One per cent. bile media. Amount of gas produced in different dilutions.								Time recording gas. Hours	Two per cent. bile media. Amount of gas produced in different dilutions.								Tubes showing 20 per cent. or over on gas formation.	
		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "	1%	2%
Sol. No. 2. Mixture	24	9	7	12	10	8	5	4	0	24	10	14	17	12	10	18	16	20	0	1
of human and horse	48	10	19	16	21	12	14	26	0	48	12	22	18	27	16	31	22	29	2	5
feces.	72	19	36	20	22	17	16	30	0	72	12	22	19	30	16	32	26	40	4	5
Isolation of B. coli		+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+		
Isolation of Strep.		+	+	+	+	+	+	+	0		+	+	+	+	+	+	+	0		

		Two and one-half per cent.. bile media. Amount of gas produced in different dilutions.									Three per cent. bile media. Amount of gas produced in different dilutions.									
		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "		10.0 cc.	1.0 "	0.1 "	.01 "	.001 "	.0001 "	.00001 "	.000001 "	2½%	3%
Sol. No. 2. Mixture	24	30	23	27	30	14	17	29	29	24	20	26	30	41	16	15	22	30	6	6
of human and horse	48	36	30	37	36	19	28	39	41	48	36	46	49	47	27	29	51	58	7	8
feces.	72	60	48	41	42	30	40	60	72	72	72	74	69	73	39	41	56	70	8	8
Isolation of B. coli		+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+		
Isolation of Strep.		+	+	+	+	+	+	+	0		+	+	+	+	+	+	+	0		

TABLE 5.

COMPARISON OF FIVE AND TEN PER CENT. BILE MEDIA ON DRINKING WATER SUPPLIES.

	Five per cent. dried ox-gall.			Ten per cent. dried ox-gall.		
	0.1 cc.	1.0 cc.	10 cc.	0.1 cc.	1.0 cc.	10 cc.
24 hrs.	2%	22%	50%	2%	16%	31%
48 "	13 "	31 "	75 "	7 "	18 "	40 "
72 "	15 "	49 "	82 "	9 "	27 "	51 "

and two dilutions higher five times. The 10 per cent. media was one dilution higher only once.

The three-day results with 5 per cent. media proved the presence of B. coli in higher dilution than the two-day results in 22 per cent. of the samples, so that it is preferable to retain the requirement of three days in the test.

Anomalies, failure to produce a positive test in the larger quantities of water tested, although obtained in smaller quantities of the same sample, were infrequent. Three were obtained with 10 per cent. media and none with 5 per cent. media.

Gas production of 5 per cent. to 10 per cent. inclusive, which did not reach a test in three days, occurred nine times with the 10 per cent. media and only five times with the 5 per cent. media.

In testing specifically for B. typhi in water at this laboratory, 100 cc. volumes are added to 500 cc. of peptone bile (without lactose) in glass stoppered bottles and incubated over night at 37½°C. We have found it advantageous in typhoid isolation to omit lactose in order to practically eliminate the formation of acidity which interferes with the development of B. typhi and produces a change of character in B. coli which later interferes with the separation of B. typhi. We have proven this by inoculating B. coli, B. typhi and streptococcus longus into lactose peptone bile (10 per cent.) and peptone bile (5 per cent.) and then isolating the B. typhi on successive days. With peptone bile (5 per cent.), B. typhi could be obtained for four days and longer. With lactose peptone bile (10 per cent.) after twenty-four to thirty-six hours the character of B. coli was frequently changed in that it lost its acidifying property.

This fact probably explains the failure in many cases to confirm the presence of B. coli upon litmus lactose agar when a presumptive test has been obtained, by those who do not rely upon the presumptive test alone. These modified forms of B. coli produce transparent non-acidifying colonies on Conradi-Drigalski media interfering greatly with the chance of obtaining B. typhi. That the character of B. coli was actually changed was shown by

rejuvenation in liver broth and the regaining of the lost functions.

The 10 per cent. media containing lactose also acquires such a heavy sediment that it interferes. This is avoided in 5 per cent. media without lactose due to both the omission of lactose and the reduction in amount of bile. In testing for B. typhi, 1 cc. is withdrawn from the bottom of the bottles and the sediment interferes with the development of colonies upon transferring direct to large Petri dishes (8″ diam.), containing Hesse agar or Conradi-Drigalski agar.

Peptone bile media is now used with great success in many hospitals for the isolation of B. typhi from stools and blood direct.

Summary.

Lactose bile containing 5 per cent. dried ox-gall is preferable to 10 per cent. media.

The formation of gas is more rapid and greater in amount. Positive tests appear in higher dilutions. Attenuated B. coli is more readily shown.

Interference by other bacteria is less in evidence, especially by streptococci.

It is especially more advantageous with sewage and badly polluted waters, but is also more delicate with the ordinary quality of drinking waters.

For the same reasons, 5 per cent. of dried ox-gall appears preferable to smaller amounts of bile in the media.

It is just as useful if not more so in the isolation of B. typhi. In this use the lactose is best omitted. The lack of formation of acidity and of sediment is advantageous. Furthermore, B. typhi may be isolated after longer incubation. In the presence of lactose, B. coli is changed in character frequently and becomes non-acidifying, this interfering with the identification of B. typhi.

The 5 per cent. bile makes a clearer media without interference from sediment. In sterilization, foaming is less apt to occur and cotton plugs are not forced out from the tubes. The fermentation tubes are more easily cleaned, hence there is less breakage and a saving in time.

A large reduction in cost of media, nearly 50 per cent., is important.

The writer is indebted to Dr. Frank E. Hale, director of laboratories, in preparation of this paper, also Mr. T. Muer, bacteriologist, for numerous determinations made at the Mt. Prospect laboratory.

A NOTE ON THE TESTING OF DISINFECTANTS.

SAMUEL RIDEAL, *London* and J. T. AINSLIE WALKER, *New York*.

Supplementary to an article published in the AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. III, No. 6 (June, 1913), page 575.

IN VIEW of the fact that the International Committee on The Standardization of Disinfectants, appointed at the last meeting of the International Congress on Applied Chemistry, cannot meet this year, owing to the war, and that this may entail a further delay of three years, we desire to call attention to one or two points which have arisen since the publication of our paper on "Approved Technique of The Rideal-Walker Test," * and to submit the following suggestions as addenda to the paper referred to.

First, in view of the difficulty experienced by some workers not familiar with the technique of the chemical laboratory, we suggest that a burette, such as that described by Hermann W. Mahr, of the Board of Estimate and Apportionment, New York, can be adopted in place of the dropping pipette. On the other hand, we know many workers who have a decided preference for the dropping pipette originally used by ourselves and who do not see the necessity for changing this detail of the technique.

The second suggestion deals with the well-known variations in resistance offered by the standard broth culture of B. typhosus. To obtain the desired result in the phenol column—life in $2\frac{1}{2}$ minutes and in 5 minutes, and no life thereafter—dilutions ranging anywhere between 1 in 80 and 1 in 140 may be required. We feel that this range is too great, and suggest, therefore, that the culture be rejected if it calls for a phenol dilution higher than 1 in 110, or lower than 1 in 190. Where the culture becomes so attenuated as to call for dilutions higher than 1 in 110, it can be strengthened by passage through any suitable animal. By restricting this range in dilution, the only rational objection to the Rideal-Walker Test is at once removed.

A new difficulty has been introduced through the war; it is impossible now to obtain supplies of Witte's Standard Peptone. We understand this matter has been taken up by an American committee, representing four prominent laboratories, with Doctor Conn as umpire, and that this committee is about to report in favor of a brand which is said to be equal to Witte's in every respect. In the meantime, it would be interesting to have the views of other workers. We, therefore, invite discussion on this point.

(Sgd.) SAMUEL RIDEAL,
August 10, 1915.

(Sgd.) J. T. AINSLIE WALKER,
August 23, 1915.

* AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. 3, No. 6; *New York Medical Journal*, March 7, 1914.

WILLIAM C. GORGAS, M. D., D.Sc., LL.D.

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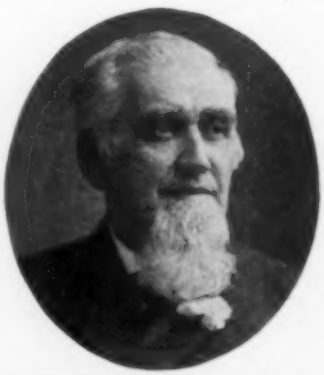
STEPHEN SMITH, M. D., LL. D.



HENRY D. HOLTON, A. M., M. D.

FREDERICK MONTIZAMBERT, M. D.

The Distinguished Sanitarians who were honored with election to Honorary Membership in the American Public Health Association at the Rochester Meeting, Sept. 1915.

*The Association regrets to announce the death of General Sternberg on November 3rd, 1915.

DR. CARLOS G. FINLAY.

WILLIAM C. GORGAS, M. D.,
Surgeon-General U. S. Army.

Address delivered at the Forty-third Annual Meeting of the American Public Health Association, at Rochester, N. Y., September 7, 1915.

I MAKE no apology for confining my remarks tonight to the life and character of Dr. Carlos G. Finlay of Havana, President of this Association in 1905.

No country owes a greater debt of gratitude to Doctor Finlay than does the United States. Doctor Finlay was the first explorer in the field of research relating to the transmission of yellow fever which afterwards culminated in the demonstrations of Reed, Carroll, Lazear and Agramonte, and has since been demonstrated by the eradication of yellow fever from Cuba and Panama. New York City would not now be the metropolis it is if yellow fever were now prevailing there as it did during the latter half of the eighteenth century and the first half of the nineteenth century. The United States would have lost thousands of its citizens and hundreds of millions in wealth during the past twenty years if Havana had continued as a focus of yellow fever.

It was Doctor Finlay's brilliant and logical reasoning that first suggested that the stegomyia mosquito was the transmitter from man to man of yellow fever.

Doctor Finlay was born in the city of Puerto Prince de Cuba, on December 3, 1833. His father was Scotch and his mother French. His father was a physician, at this time practising his profession in that city. Young Finlay was given an excellent general education, having had the advantage of schooling in Cuba and in Europe. He took his medical degree in 1855 at the Jefferson Medical College, Philadelphia. Most of his long professional life was spent in Havana, Cuba, specializing on diseases of the eye. At the session of the International Sanitary Conference, to which he was a delegate, held in Washington in 1881, he first made public his views concerning the transmission of yellow fever. From that time on he was constantly writing and publishing theses upon this subject. When the Spanish-American War broke out he offered his services to the United States and served through the Santiago campaign as an acting assistant surgeon in the U. S. Army. Though he was then sixty-five years old he went to the front with the troops and suffered without complaint the very unusual hardships of the Santiago expedition. His services at Santiago were of great value, due to his unusual knowledge of yellow fever. He afterward served with us in the Sanitary Department of the city of Havana. When the American occupation ended in 1902, Doctor Finlay succeeded me as Chief Sanitary Officer of the city. In 1908 he was retired from this position with a liberal pension. He died August 20, 1915. Doc-

tor Finlay was one of the fortunate men who lived long enough to see his work generally recognized and he has just died, honored and revered by all the scientific world for the important part which he played in the discovery of the method of the transmission of yellow fever. He was the recipient of the Mary Kingsley medal, was made an officer of the Legion of Honor by the French government, and was awarded many other honors.

I had the honor and pleasure of knowing Doctor Finlay well. We were closely associated for four years in our Cuban work. We were both members of a board whose duty it was to see every case thought to be yellow fever in the city of Havana. This duty brought us together nearly every day. I formed the very highest opinion of Doctor Finlay's scientific ability. His personal character impressed me so that I can look back through life and see few persons for whom I formed a greater affection.

He was a most genial, kindly, modest man, but strong and determined when he thought any matter of principle was involved.

Of the workers in this great discovery, who were collected in Havana fifteen years ago, Finlay, Carter, Reed, Carroll, Lazear, and Agramonte, Carter and Agramonte alone remain. I like to picture the meeting that has taken place between two such great spirits as Finlay and Reed. I would say: "Requiescat in pace," except that I know such souls do not desire to rest in peace but are continuing development along the altruistic lines which they so preëminently adorned in this life.

Health Department Reports and Notes.

REPORTS.

Seattle, Washington.

In the Report of the Department of Health and Sanitation of Seattle for the calendar years 1912, 1913, and 1914 is presented an impressive account of the work which has been accomplished by the Department under the Commissionership of Dr. J. S. McBride. The Commissioner finds a further decrease in the general death-rate over the previously low figures, the crude rate being for the three years 8.15, 8.37, and 8.10 respectively. "The statistics for the year 1914," remarks the Commissioner, "show Seattle to have the lowest death-rate in the existence of the city and therefore it is more than probable that Seattle enjoys the lowest death-rate of any city of equal size in the world, the position she has occupied since the Census of 1910." Conspicuous decreases are noted in tuberculosis, in communicable diseases of childhood, and in diarrhea and enteritis under two years of age. Deaths are tabulated according to the International Classification, though by months instead of the usual arrangement under age-groups. The communicable disease work has been furthered by the completion of a new isolation hospital.

Under the head of typhoid fever it is remarked that, while fully 60 per cent. of the cases come from outside the city, the dangers in this disease should be decreased through extension of water and sewer mains in certain districts. The water "has been closely guarded during the year by two inspectors and one physician constantly on duty. We have insisted on Widal tests and typhoid inoculation of everyone going into the water-shed and, although many men were employed there during the year, not a single case of typhoid fever was discovered."

The tuberculosis division was very active and presents an interesting report. A child welfare division has been organized, one of its first activities being the investigation and licensing of infant boarding.

More than half of the maintenance budget of the Health Department was required for garbage collection and disposal. The method used is that of "sanitary fills," on city property with few exceptions. The Commissioner gives as his finding, based upon laboratory and other investigations, that he has as yet "failed to find any valid reasons for discontinuing the present method, from a health standpoint."

Milk inspections and analyses are reviewed and a plea is made for a new ordinance covering pasteurization, bovine tuberculosis, etc. The city is supplied by 11,000 cows on 1,275 dairies, indicating a very considerable problem, and under present conditions it is creditable that the percentage of milk samples above the state bacterial standard of 200,000 was not higher than 13 per cent.

A clear graphic representation of the organization of the Department is given, showing Divisions of Tuberculosis Control and Medical Inspection, Sanitation, Emergency Hospital, Garbage, and Clerk and Vital Statistics.

The report is well printed and the matter most attractively presented. For convenience of reference of a table of contents, with pagination, might well be added.

Long Branch, New Jersey.

Refreshment and a sense of admiration for good work well reported are the sentiments produced by the reading of the First Annual Report of the City of Long Branch, N. J., for 1914. The report is a clear, concise, interesting record of valuable constructive work which marks the beginning of modern health control in this community. Both in form and in substance, it may be considered on the whole a very worthy approach to the model for its class —an excellence all the more praiseworthy in a first report.

With a permanent population of some 15,000, Long Branch may be put down as a member of the numerous genus of small cities, with the exception that, being a seaside resort, it receives during the summer months a large temporary increment of population which brings certain peculiar sanitary problems—as, for example in connection with the swelling of milk supplies. Thus the maximum population is estimated as high as 60,000 for a short time, while an average of 20,000 for the whole year is a fair assumption.

Many activities pursued by modern health authorities are, it is true, merely touched upon in the report of the Health Officer, Mr. John Hall, but the aim has been at the beginning "to do a few things well rather than to attempt too much." Hence the report deals in the main with the work done in suppressing communicable disease and in improving the milk supply.

The first step in the improved order was the appointment of a competent health officer, licensed by the state. It is of interest to note the substantial part played by public-spirited and generous citizens in putting the better health organization on its feet. The salary of the health officer for three months, until the beginning of a new year, was paid out of a fund raised privately by a group of citizens known as the "Clean Milk Committee." From this same fund also was equipped a laboratory for milk analysis, and a motorcycle provided, which were subsequently turned over to the Board.

The sanitary status of the city as shown by vital statistics is given its due position of importance, with explanatory comment on the figures. Regarding population a peculiar difficulty, already alluded to, is met with—viz., the large temporary summer population. The estimated average for the year, as the health officer points out, is by no means exact, but a fairly accurate basis for death-rates is reached by excluding the deaths of non-residents brought for treatment in the local hospital and basing the rates on the census estimates for permanent population. By this method a general death-rate of 15.1 per thousand is obtained.

The recording of cases of communicable disease has, under the new régime, been put on a systematic basis by means of history cards and a spot map, and reporting has been much improved. The institution of microscopic work in the health department laboratory has been a decided step in advance. The tests for diphtheria and other diseases are made by the State Health Department, but the saving in expense of mailing specimens and of time in waiting for reports makes it very desirable, says the health officer, to have the work done locally.

Excellent work is recorded in improvement of the milk supply, the important measure of a graded classification based on pasteurization and the tuberculin-test having been adopted. Eighty to 95 per cent. of the milk is pasteurized, while all raw milk is from tuberculin-tested cows. This Board is fortunate in having only seven to nine dealers to reckon with, though many of the dairies are so far distant that the extensive coöperation of the State Dairy Division had to be obtained.

Private water supplies were examined, inspected and analyzed, and 34 out of 46 wells were found to be polluted and were ordered closed. The health officer comments quite justly on the danger of such sources of supply in communities having wells and privies, and indicates the abolition of both as an important future line of work.

A number of other lines of inspection work are reported and an account given of the enforcement of regulations for barber shops. Considerable publicity work, such as is particularly useful in the outset of a sanitary campaign, was carried on, articles in the local press taking the first place. The text of four excellent milk publicity charts is reproduced. In conjunction with the neighboring community of Asbury Park a public meeting in the interest of improved milk supplies was held and given considerable publicity. The report closes with summaries of new ordinances and of prosecutions. A convenient table of contents (which might better appear in the front of the report) is appended.

In the general excellent and pleasing effect of this report one is apt to overlook deficiencies. These, such as have been noted above, lie in omissions which will no doubt naturally be supplied in future reports from this source.

Ottawa, Ontario.

The Annual Report of the Ottawa Health Department for 1914 presents the record of much creditable work, though the fact that most of the matter appears in eight separate reports of staff officials makes a summary view somewhat difficult—a disadvantage which might be remedied by a brief general survey, of salient points, in the report of the Medical Officer of Health.

The estimated population is given as 101,795, though the mode of estimation is not mentioned, and the total deaths as 1,868, which, by deduction of 206 non-resident deaths, gives a rate of 15.26 per thousand. The specific death-rates for the various communicable diseases and for infant mortality do not appear.

Deaths are classified by cause apparently according to the International Classification, which is now becoming, as it should be, general in health reports, but it would be desirable to have the table so headed and the numerical designations of the causes given.

Under the head of diphtheria, which for three years has shown a high prevalence, the following noteworthy comment appears: "This is a most regrettable condition of affairs, where we know that practically all of these cases died owing to delay in calling for treatment. It cannot be too strongly impressed on the people that all cases of sore throats and croupy conditions should be seen by a physician without delay, both for themselves and the general public. Many cases are but slightly ill and yet if untreated are capable of carrying the disease in a most malignant form to others. This is especially true of the form affecting the nose, in which a discharge from the nose may be the only sign noticed. People should not delay in calling in a physician at once, and if they are unable to meet the expense, the Health Department should be notified and a physician will see the patient." The Isolation Hospital report shows, in confirmation of the above, that, out of 51 deaths from diphtheria, 27 of the patients died within 48 hours after admittance. The occurrence of five cases of scarlet fever and seven of diphtheria among the hospital staff (two cases of internes and ten of nurses) is remarked.

Dairies are scored but once a year, a frequency which may indicate conditions but can hardly result in much improvement in those numerous cases where repeated re-inspections and advice are necessary. Data as to scores are not given. Two thousand and twelve samples of raw milk showed an average bacteria count of 259,000; 202 samples of pasteurized milk, 31,000; 202 of "nursery" milk, 28,000. Individual figures for the dealers are not, however, given.

An epidemic of typhoid fever occurred in October, 1914, in which month 59 city cases out of the year's total of 119 cases were reported. This is attributed by Mr. Joseph Race, the bacteriologist, to fly infection. "Protection against flies was relaxed too early owing to several cold days during the early part of the month, with the result that there was no protection during the period following summer prevalence and when the climatic conditions drove the flies to the warm houses." This scanty evidence is far from convincing, and the possibility of milk infection is not mentioned.

The report would be improved by the addition of financial statistics and some statement of prosecutions conducted. A list of the Board and staff and a table of contents are also missing features.

In the absence of Medical Officer of Health, Dr. T. A. Lomer, on account of the European war, the report is presented by Dr. R. Law, Acting M. O. H.

Calgary, Alberta.

This Report, for 1914, is a showing of excellent progress during the year in tuberculosis control, infant hygiene work, sanitation of milk supplies, housing and municipal cleanliness, and increased coöperation on the part of the public. "A constructive policy aiming at the 'prevention' rather than 'control and cure' of disease" adopted by the Department of Health at its reorganization two years ago is evidently producing results. Few important criticisms suggest themselves in connection with any section save that on vital statistics. The Medical Officer of Health, Dr. C. S. Mahood, here labors under the disadvantage that registration of

vital records is not under the control of the Board of Health. There is, however, a clear statement of deaths and a number of figures of importance are given. The deficiency lies in the failure to give any statement of population or of death-rates for chief and communicable causes. The only rates given are those for general death-rate, 8.8 (a marked decrease over the preceding year), and infant mortality, 123.6 deaths under one year per thousand births. Inasmuch as the medical health officer claims "the lowest death-rate for the city for a good many years and the lowest death-rate of any city in Canada, and with but two exceptions, the lowest death-rate of any city of its size and over on the continent," the absence of the population basis for that rate is all the more conspicuous.

There was a marked decrease in the intestinal diseases of infants, "due to the splendid work of the Child Welfare nurse, the proper supervision of the milk supply and the operation of the Pure Milk Depot for bottle-fed babies." Remarkable diminutions in deaths due to pneumonia from 80 in 1913 to 48 in 1914, and in broncho-pneumonia from 22 to 4, is ascribed to "the war waged in the overcrowded districts and the educational campaign insisting on proper ventilation in apartments, homes, and theatres, etc."

Marked progress was made in the improvement of milk supplies, but a total of 220 bacteriological milk samples, limited to three months in early spring, does not indicate an adequate degree of supervision in this direction. The statement that milk tests have been performed every month is not borne out by the report of the Milk and Dairy Inspector.

Inspections of meats and other foods are detailed in full, and it is evident that excellent work has been done in this department. The Chief Sanitary Inspector reports that a very successful "Clean-up Week" was held, and that the coöperation of the public has been gained to such an extent that the number of prosecutions in his Department was reduced from 229 in 1913 to 78 in 1914. Statistics are given on the collection and disposal of refuse, which is managed by the Health Department. The cost of collecting garbage was 63.27 cents per cubic yard; for ashes the cost was 40.77 cents. The refuse was destroyed by incineration at a cost of 27.35 cents per cubic yard.

Altogether the report is clear and readable, but would be improved by the addition of a financial statement and a page showing staff and organization.

NOTES.

Birmingham (Ala.) Broke!—The city of Birmingham, Alabama (population 150,000), has discontinued its street sprinkling and garbage collection, dispensed with its health officer, city physician and milk inspector, abolished its recreation department with play-grounds and indoor gymnasium and has cut off every cent of its appropriations to hospitals, children's homes and all charities! These are but a few of the wholesale measures for cutting down expenses adopted by the City Fathers when they recently found that the city was spending about $1,000 a day more than it had to spend.

Since the power of regulation of taxes is delegated by the state constitution to the legislature—a body which meets once in four years, the city decided that at present the best thing to do was to have only as much government as it could pay for—and is now having it.

This experiment in enforced retrogression will be interesting to watch from a public health standpoint.

Get That Measle!—The New York City Health Department is making an effort this year to supervise better the return of convalescent measles victims to the city schools. Each physician reporting a case of measles receives copies of the two following blanks:

Department of Health, City of New York.

Borough of....., 19

Your report to the Department of Health that.....

.....is ill with measles and under your professional care, is hereby acknowledged. The patient should be kept away from others.

Children and teachers with measles are excluded from school. They are permitted to return five days after appearance of rash, provided all catarrhal discharges and rash have disappeared.

Others in the family who have had measles may continue at school.

Those who have not had measles are excluded from school until fourteen days after date of last exposure.

EUGENE W. SCHEFFER,
Secretary.

IMPORTANT: The teacher or child receiving this certificate will present same at the school.

This is to certify that on.....I examined .....of..... who has had measles since....., 191....., and that he—she may return to school.

.....M. D.
Attending Physician.

Blank certificates for the others exposed will be furnished on request.

BUREAU OF PREVENTABLE DISEASES.

The physician is thus placed in full charge of the return of the pupil or teacher to school.

Fumigation Discontinued.—Fumigation as a means of terminal disinfection was condemned and abandoned in the city of Milwaukee last June and operating now on the assumption that "fumigation is of no particular value" and "a waste of money," the health department is endeavoring to secure the wider application of isolation, bed-side disinfection, scrupulous cleanliness via the soap and water method, thorough boiling of bed linen, exposure of all clothing, etc., to sunlight, and similar measures for constant and thorough cleanliness.

Minnesota Bulletins on Rural Sanitation.—Mr. H. A. Whittaker, Director of the Division of Sanitation of the Minnesota Department of Health, has prepared and issued two very interesting and useful bulletins dealing with sanitation in rural communities. The one is entitled, "Farm Water Supplies" and the other, "Sewage Disposal in Unsewered Districts."

The foreword of the bulletin on water supplies states that it was originally prepared for the purpose of advising farmers as to the proper method of obtaining a safe water supply from a sanitary point of view. It was later endorsed by the State Department of Education in relation to water supplies for rural schools. In this bulletin Mr. Whittaker significantly emphasizes the point that it is not so often by seepage through sandy soil from privy or stable that pollution enters a well, as by the actual surface drainage of water from nearby sources of pollution into improperly located and poorly constructed dug wells. This is admirably illustrated by several drawings. There are other drawings showing how wells should be constructed to prevent the entrance of pollution at the top. There are also illustrations showing how springs may be protected from pollution, and drawings depicting the properly and the improperly constructed cistern.

The other bulletin mentioned, "Sewage Disposal in Unsewered Districts," is also profusely illustrated and the topics briefly discussed include, "Location of Fixtures," "The Sewer," "The Disposal or Purification Plant," "The Leaching Cesspool," "The Watertight Cesspool," and finally, under the title "A Permissible Sewage Disposal Plant," Mr. Whittaker describes in a few paragraphs a private disposal plant consisting of a settling tank and a secondary dosing tank with a siphon discharging into a tile grid laid below the frost line in porous soil. A tile underdrain system laid below the grid is recommended especially where the discharge is in very fine compact loam or clay.

A Good Cover.—On the cover of the North Carolina *Health Bulletin* for August appeared the following warning in bold face type:

Signs of Tuberculosis.

What Everybody Should Know About the Symptoms of the Great White Plague.

Your chances for recovery depend upon an early diagnosis. The later in its course the disease is found the less chance there is for recovery.

A hemorrhage from the lungs means tuberculosis without exception.

A subnormal temperature (by the thermometer) in the morning and an afternoon rise of temperature means tuberculosis 99 times in 100, and the other time too, unless it can be accounted for otherwise by a doctor.

A low blood pressure, taken with a proper instrument, is suggestive of tuberculosis.

A cough that lasts more than three weeks should suggest tuberculosis, and make you seek an examination by a competent physician.

The tubercle bacillus in the sputum is a posi-

tive sign of tuberculosis, but the diagnosis should be made long before this can be found.

Free Biological Products.—Free smallpox and typhoid vaccines and diphtheria and tetanus antitoxins will be distributed to the indigent poor of the state, announces the September *Bulletin* of the Kansas State Board of Health.

The prices to physicians of the state will also be very much reduced.

Michigan's Opportunity.—In the editorial columns of the *Journal of the Outdoor Life* for September we read:

"Few states have had the opportunity in the anti-tuberculosis campaign which now is offered to the state of Michigan. The recent session of the legislature granted an appropriation of $100,000 for two years of work in the prevention and control of tuberculosis. What can Michigan do with that amount of money in two years?"

Answering his own question the editor concludes that:

"It would seem as if the most logical and wisest expenditure of this money should be first along the line of a survey or study of the tuberculosis situation, and secondly along the line of an extensive and intensive educational campaign that should have for its object the securing of adequate care for every consumptive."

Board of Health Contracts.—That a contract, made between a board of health and one of its members, is illegal and void—is the decision of the Supreme Judical Court of Maine in a recent opinion published in the *Public Health Report* for October 1, 1915.

The plaintiff, one of the three members of the Rumford, Me., Board of Health, had been employed by the board to care for a patient suffering from a contagious disease. Although there was no concealment in the making of the contract, the court decided that it was not proper for the plaintiff to take part as a member of the board in making a contract with himself as an individual. Had he taken no part himself the action of the board must have been influenced by the fact of his membership.

It is submitted that this case is not to be relied upon as representing the undivided opinion of the bench throughout the country upon this point. There are numerous cases in the books where it has been held that a contract made under circumstances similar to those stated here, is valid if there was a majority in favor of it without the vote of the member to whom it was awarded.

Advertising the Department.—A well advised issue of the *Bulletin* of the New London (Conn.) Health Department pictures in a most commendable graphic form the results of the activities of the city health department during the last eight years and correlates with those results, the extent and distribution of its appropriations. An effective diagram also compares the amounts of money received by the various city departments. The booklet deserves praise not only because the diagrammatic method is used, but also because the diagrams are exceptionally clear and quite intelligible to the laymen whom the *Bulletin* is designed to reach. The normal population of New London is nearly 21,000.

A New Voice.—A new name was added to the growing list of regular health publications, when Vol. 1, No. 1, of *Public Health News*—a monthly published by the Department of Health of the State of New Jersey—appeared in August. Director of Health J. C. Price, in his "Word of Greeting," after pointing out the modern tendency toward public health education, concluded:

"*Public Health News* regards itself as a tool, or educational device, with which the State Department of Health may labor against ignorance, indifference and inefficiency in health work. As an antidote for ignorance, *Public Health News* will seek to impart information; as a remedy for indifference, *Public Health News* will strive to arouse interest; as a cure for inefficiency, *Public Health News* will advocate special training and coöperation."

Copies are free on application.

Coöperative Public Health Instruction.—A coöperative course between the junior students in the two medical colleges in Cincinnati, Ohio, and the City Health Department is now under way.

Thirty-two days of actual field work will be required and attendance at a series of ten lectures

by practical health officials and sanitarians comprise the course. The program follows:

The thirty-two days have been arranged as follows:

Laboratory:	
Microscopic	3 days
Milk and Water	1 day
Meat Inspection (Animal Pathology)	3 days
Milk and Dairy Inspection	1 day
Bakeshop Inspection	1 day
Barbershop Inspection	1 day
Outdoor Sanitation	2 days
Fumigation	2 days
School Medical Examination	18 days

The following conferences have been arranged; all students will be expected to attend these practical discussions:

December 2, 1915.

2.00 p. m. Fundamental Principles in Health Conservation. J. H. Landis, Health Officer.

3.00 p. m. The Control of Communicable Diseases. Wm. H. Peters, Chief Medical Inspector.

December 7, 1915.

2.00 p. m. Health Promotion of School Children. Wm. H. Peters, Chief Medical Inspector.

4.00 p. m. The Value of Laboratory Diagnosis. Frank Maltaner, Bacteriologist.

December 9, 1915.

2.00 p. m. Outdoor Sanitation, Interpretation of Common Terms. Jacob Shuey, Assistant Chief Sanitary Inspector.

3.30 p. m. Disposal and Purification of Sewage. W. C. Folsom, Chief Sanitary Inspector.

December 14, 1915.

2.00 p. m. Vital Statistics. E. Walter Evans, Registrar.

3.00 p. m. Water and Water Purification. W. C. Folsom, Chief Sanitary Inspector.

December 16, 1915.

3.00 p. m. Principles of Dairy Inspection (Illustrated); Meat Inspection. R. B. Blume, Chief Food Inspector.

December 21, 1915.

3.00 p. m. Standard Methods of Milk Analysis and Water Analysis. Clarence Bahlman, Chemist.

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Baby Week.—Indianapolis babies had the center of the stage in that city for an entire week's performance October 3–9.

Literally thousands of people accepted the opportunity to inspect and appreciate the infant welfare work and the institutions—public and private—for carrying on this work. The program for the week consisted of special services in churches and exercises in schools, visits to various private institutions, such as hospitals, settlements, milk stations and the juvenile court; inspection of playgrounds; and culminated in a baby show.

Following closely Disease Prevention Day on October 1, interest was easily aroused and the response more general.

✽

47,000 Immunized.—In ten counties in North Carolina forty-seven thousand people were given the typhoid prophylactic treatment in a wholesale experiment carried on by the state. The average cost per capita immunized in the last twenty-five thousand was 14.2 cents. The interest created waxed to such proportions that the State Health Department was unable to carry on all of the work that was demanded—with the result that several local campaigns in other counties were started, and a large number of treatments given.

Public Health Notes.

Minnesota Public Health Association Meeting.—On September 29, a very enthusiastic public health meeting was held at Rochester, Minnesota, under the combined auspices of the Minnesota Public Health Association and the Minnesota State Sanitary Conference. This meeting was held at the Mayo Clinic at the Mayo Hospital, Rochester, and the attendence was so large as to test the capacity of the auditorium. Among the speakers at this conference were Governor Hammond of Minnesota, President Vincent of the State University, and Dr. H. M. Bracken, Executive Officer of the State Board of Health.

A great deal of credit for arranging and carrying out the excellent program which was presented belongs to Dr. I. J. Murphy, who is president of the State Sanitary Conference, and acting executive secretary of the Minnesota Public Health Association.

An encouraging evidence of a desire for greater coöperation on the part of the health officers of Minnesota and other persons interested in the cause of public health is the fact that at this meeting it was decided to consolidate the two organizations holding this program and to continue the State Sanitary Conference as a section or committee of the Minnesota Public Health Association. Among the topics discussed at this meeting were the following: The Clean Milk Problem, Chronic Pathological Changes of Middle Life, Community Control of Tuberculosis, School and Municipal Health Nursing, The Control and Prevention of Typhoid.

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Insurance Companies vs. Alcohol.—Valuable testimony of the undoubted effect of alcohol on the general health and longevity of men who use it in varying degrees was submitted in statistical form at the Eighth Annual Meeting of the Association of Life Insurance Presidents, as pointed out by the New York City *Weekly Bulletin* of the Department of Health of July 31. Additional significance is given these figures because the purpose of their preparation was not "to excite public interest or curiosity but for actual use in a great business." The statistics were compiled by 43 leading companies and covered two million lives over a period of twenty years.

"With regard to men who had used alcoholic beverages daily but not to excess, the experience of the companies was divided into two groups: (a) men who took two glasses of beer, or a glass of whiskey, or their equivalent, a day; (b) men who took more than the foregoing amount, but were not considered by the companies to drink to excess. *The mortality in the second group was found to be fully fifty per cent. greater than in the first*, an excellent argument for moderation in the use of alcoholic beverages.

"The Committee of the Medico-Actuarial Mortality Investigation did not make a report on the mortality among total abstainers, but *sufficient statistics have been published by individual companies to justify the statement that persons who have always been total abstainers have a mortality during the working years of life of about one-half of that among those who use alcohol to the extent of at least two glasses of whiskey per day.*"

The JOURNAL has printed notes touching this topic before and it is interesting to note that the material of this sort which is being circulated is constantly increasing.

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Octavia Hill Association.—Nearly 4,000 Philadelphia families sleep, cook, eat, wash their clothes, entertain their friends and even take in boarders in single rooms! Along with this statement comes the announcement in a bulletin recently published by the Octavia Hill Association of Philadelphia, that sanitary houses can be furnished the working man at a rental within his reach by this organization, and that the money so invested yields and has yielded for 18 years—the proper and reasonable return of 4 per cent. per annum.

In the bulletin is a very interesting "plan for a model set of houses with playground."

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Standard of a Habitable House.—The March *Journal* of the Royal Sanitary Institute contains a discussion by A. B. Dunne regarding the standards upon which judgment should be based

regarding the habitability of a house. The conditions justifying the representation of a house as so "dangerous or injurious to health as to be unfit for human habitation are as follows:

"1. Dampness in living rooms of old houses, due either to walls built without damp courses, or of very hygroscopic materials, such dampness rising up the walls to a considerable height, or extending over a large area, and persisting even in dry weather.

"2. No through or sufficient ventilation. Among such dwellings I would include those houses which are built 'back to earth,' where the adjacent earth reaches a high level, and back to back houses, so common in the northern towns.

"3. General dilapidations, under which I include cottages with walls perished, roofs leaky, rafters rotten, bedroom floors sprung and unsafe, and broken tiles laid on earth.

"4. The hopeless cases, for instance, dwellings which have been improvised out of old malt-kins, barns, cart-sheds, and other miscellaneous buildings."

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M. V. P. H. A. Holds Meeting.—The annual meeting of the Missouri Valley Public Health Association at Kansas City, Mo., September 28–29, succeeded in creating a large amount of enthusiasm. Among other speakers of note, Dr. Lydia A. DeVilbiss, Bureau of Child Hygiene, discussed "Child Hygiene and Public Health," ably, and Mr. D. O. Decker, Civic Commissioner, St. Joseph, Mo., struck a responsive chord when he ended his paper on "The Relation of Public Health and Business" with—"Talk Prevention. Keep before his (the business man's) mind the fact that half our deaths under 40 years of age are preventable; that public health is the cheapest form of life insurance we have, and pays dividends in keeping him alive, not in burial expenses. Ask him to look over his accounts and see how much he has lost through preventable sickness among his customers."

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Sherley Amendment Constitutional.—The following note from the *Public Health Report* for October 8, 1915, tells of another forward step in the legislative fight against patent medicine quacks:

"The United States District Court for the Eastern District of Pennsylvania has decided that the Sherley amendment to the United States food and drugs act is constitutional. This amendment makes it unlawful to print on the package or label of any drug false and fraudulent statements regarding its curative or therapeutic effects.

"The defendant was charged with misbranding a proprietary medicine which was sold under the name of 'Bad-Em Salz,' and with making false and fraudulent statements as to the curative properties of the remedy. The defense denied that the remedy was misbranded or that the label was calculated to mislead purchasers as to the composition or ingredients of the drug. It was also asserted that the statements relative to the curative properties of the drug were honestly made, that they were expressions of opinion, and that the defendant could not be convicted of crime merely because an opinion was expressed regarding the effects of the drug which differed from that of most physicians.

"The court held that the two questions (1) whether the name and label were such as to mislead purchasers respecting the composition of the drug, and (2) whether the statements regarding the curative properties of the drug were false and fraudulent, were both questions of fact which it was the duty of the jury to decide. The jury having decided both questions in the affirmative the conviction of the defendant was sustained."

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Second Pan American Scientific Congress.—The second Pan American Scientific Congress will be held at Washington, D. C., December 27, 1915, to January 8, 1916.

The first meeting of this kind was assembled in Santiago, Chile, in 1908.

Of particular interest to public health men and sanitarians will be the work and laboratory conferences of Section VIII, Public Health and Medical Science.

This section, one of the most important of the Congress, will discuss subjects of vital Pan American interest in the field of infectious and nutritional diseases, vital statistics, public health measures, sociological medicine and sanitation. A most valuable feature of the program of this section will be the three laboratory conferences on Anaphylaxis, Protozoa and Cancer. The leaders of these three symposia, in which some of the most eminent Pan American special-

ists will take part, are respectively Dr. John F. Anderson, President American Public Health Association, Washington, Professor Gary N. Calkins of Columbia University, and Dr. Leo Loeb, Director Department of Pathology, Barnard Skin and Cancer Hospital, St. Louis.

The Chairman of this Section is Surgeon-General William Crawford Gorgas, perhaps the most distinguished American expert in tropical medicine of Pan American reputation.

Glen L. Swiggett, Ph. D., Pan American Union, Washington, D. C., is Acting Secretary-General.

Fuller's Earth or Kaolin.—"According to the researches of Hektœn at the Memorial Institute for infectious diseases, kaolin properly applied in the form of a dry powder removes diphtheria bacilli in the course of three or four days. For this purpose the kaolin is blown into the nose or throat six or seven times a day at two-hour intervals through a glass tube. The insufflation is repeated several times at each treatment. The success of this measure appears to depend largely on the free and thorough distribution of kaolin over the nasal surfaces.

"In a number of cases, in some of which there were a great many diphtheria bacilli in the throat, complete and apparently permanent removal was accomplished in from two to four days, the throat to a large extent being freed from all bacteria.

"It seems, then, that kaolin may prove of great value in removing pathogenic bacteria from various surfaces of the body by virtue of its mechanical effect. This may prove of especial advantage in sterilizing 'carriers,' some of whom prove exceedingly obstinate under other treatment.

"In acute infections this medication is worthy of wide application by the profession—and a careful record should be kept and reported to establish its final place in antisepsis. If its value is proven, it will be a boon to public health in the control of contagious disease."—*Bulletin*, September 25, 1915, Chicago Board of Health.

Saving the Sight of Babies.—An admirable article under the above heading appeared in *The Survey* for October 9, 1915. The author is Carolyn C. Van Blarcom, secretary of the National Committee for the Prevention of Blindness. The following excerpt is interesting:

The value of some such practical work as outlined above has been demonstrated in a few, but deplorably few, of our American cities. Conspicuous among these is Buffalo, where each physician has recently been notified by the Department of Health that:

"'1. Babies' sore eyes is a reportable disease, under the state law.

"'2. It is the intention of the department to prosecute doctors and midwives alike who are found to be disregarding this legal requirement.

"'3. As the sole purpose of the department in taking this attitude is to safeguard the eyes of babies, it will give as much assistance to the doctors as they wish or will accept; and, therefore,

"'a. Nursing service and bacteriological examinations are offered to those doctors who request this form of assistance, or

"'b. Hospital care will be provided for those infants who need more attention than can be given at home.'

"More than this, a nurse from the Bureau of Child Hygiene visits each midwife case reported, to ascertain, among other things, the condition of the baby's eyes. If any redness, swelling or discharge is discovered, this information is telephoned to the chief of the bureau, and a doctor is sent without delay.

"It cannot be denied that such work as is being carried on in Buffalo would be impossible for many local health officers to undertake because of the absence of legal authority to act; lack of facilities to carry out the law should one exist; or, most important of all, lack of support of such public health work by the community. No amount of effort on the part of the health officer can be effective if, after bringing a case into court, the judge dares to throw it out with the remark: Any baby may have sore eyes, just as anyone may fall downstairs—as actually happened in Connecticut."

Focusing Public Opinion.—"Working through 890 local committeemen, the Ohio Public Health Federation was able so to direct public opinion that, during the eighty-first General Assembly of the state, nine health bills which the federation endorsed were enacted into law, eight which

it opposed were defeated and only five failed to pass which it had approved.

"Such is the encouraging report of the first five months' activity of the federation. The organization aims 'to unite the activities of all state organizations interested in public health and so bring into publicity each legislative measure dealing with the health of the people.' It includes the following seven societies, each of which has an accredited representative on the executive council of the federation: the state medical, dental and pharmaceutical associations; the homeopathic and eclectic societies; the veterinary medical association, and the anti-tuberculosis society.

"These volunteer organizations had worked separately in the cause of public health in other years. But the results were unsatisfactory; much energy was wasted through duplicated efforts; and legislative campaigns were weakened by a lack of definite information regarding pending health measures. To remedy this, a plan was devised and carried out this year, whereby frequent confidential bulletins were sent from the central legislative council to coöperating committeemen, each committeeman keeping in touch with the member of the legislature residing in his county."—*The Survey*, September 4, 1915.

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Later History of a Typhoid Carrier.—The story of the observation of a typhoid carrier during fourteen months following his apprehension in 1912 is told in a reprint from the *Journal of the American Medical Association* for June 19, 1915. The carrier, "H. O.," who was observed by Dr. Wilbur A. Sawyer, Secretary of the California State Board of Health, was distributing a particularly virulent variety of B. typhosus on board a ship before discovery. His victims numbered twenty-seven. The following summary and conclusions are of unusual interest:

"1. Although frequent examinations of the feces of the typhoid carrier H. O. gave negative results for four months after he had been treated with autogenous typhoid vaccine, he infected three persons when subsequently released from quarantine on parole. The total number of persons infected by this carrier is thirty, including five who died.

"2. In a further attempt to cure this carrier, the gallbladder and its duct were removed surgically, but the typhoid bacillus was found in the feces several times after the operation. Examination of the gallbladder showed that it was normal and that its contents were free from typhoid bacilli.

"3. After forty-one successive examinations of feces during a period of fourteen months, all with negative results, the typhoid bacillus was isolated from stomach contents containing bile.

"4. Certain typhoid carriers are unusually dangerous and must be controlled by quarantine or other adequate supervision."

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Hurrah for the "Superintendents."—Compulsory medical examination of school children was endorsed by the Convention of County Superintendents which held its annual meeting in the House of Representatives at Indianapolis, June 17, 18. The resolution was as follows:

WHEREAS, The health of the school child is paramount, all progress and improvement being dependent upon health, and

WHEREAS, Actual experience in medical inspection has shown that 60 to 80 per cent. of school children are handicapped by physical defects and disease, therefore be it

Resolved, By the Annual Conference of County Superintendents that compulsory medical examination of school children should be instituted. We therefore recommend to the 70th General Assembly of the State of Indiana that medical inspection and proper health care of children by parents be made compulsory.

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Sea Air vs. Surgical Tuberculosis.—At the corner of Surrey Avenue and the Boardwalk, Ventor, Atlantic City, is located The North American Children's Sanitarium. It is the culmination of the fourteen years of successful work on the part of a group of people inspired by the *North American* of Philadelphia (1901–1909). The original purpose followed through nine years was to care for children suffering from non-contagious diseases during the hot summer months. European and American experience has led to the observation that sea air is especially beneficial to sufferers from surgical tuberculosis, and so, since 1909, the present institu-

tion has restricted its admissions to poor children with surgical tuberculosis.

This step has been justified, in the opinion of experts, many times over. The present capacity is forty-five beds—in which were treated during the year ending March first, 1915, seventy-nine patients. The average age of the patients was 5½ years and the average stay 131 days.

Personal Notes.

Mr. Frank Bachmann, formerly of the Illinois State Water Survey and for the past five years assistant chemist and bacteriologist at the Sewage Testing Station of the Sanitary District of Chicago, has accepted a position as analyst to the Sanitary Engineering Department of the California State Board of Health.

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Four new whole time county health officers were elected in North Carolina during September. They are: Dr. C. D. Absher of Vance County, Dr. M. T. Ezerton of Pitt County, Dr. E. R. Hardin of Sampson County, Dr. J. C. Braswell of Nash County.

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Dr. David N. Roberg, the newly appointed state health officer of Oregon, will assume charge well equipped to perform the duties of his office. After graduating from Rush Medical College in 1908, Dr. Roberg served his interneship and in 1910 came to Portland as professor of anatomy in the Medical Department of the University of Oregon. Later he was given the chair in pathology, remaining in charge until 1913, when he resigned to go to the Orient as a special officer of the State Board of Health for the purpose of studying those tropical diseases, especially cholera and plague, which may at some time menace the health of the United States. The bill providing for such an appointment was passed in 1913 and was part of a movement participated in by several states.

Dr. Roberg remained in the Orient two years. During the first year he was stationed in Manila and took the degree of Doctor of Tropical Medicine in the Graduate Department of the University of Manila. From there he went to Shanghai and became associate professor of preventive medicine in the Harvard Medical College in that city. Upon the expiration of the term for which he was appointed by the State Board of Health, he returned to Oregon and was elected state health officer by the members of the board. The diversified opportunities which he has enjoyed should be of great value in maintaining the high standards of the State Board of Health. Proud of the achievements of the board, the physicians of Oregon can be counted on to lend him every assistance and a bright future is before him.—*Northwest Medicine*, for October.

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Dr. Edward Guion of Atlantic City was recently appointed president of the board of examiners of health officers and sanitary inspectors of the state department of health, and A. Clark Hunt, M. D., of Metuchen, secretary and treasurer.

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Dr. John F. Anderson, who was elected president of the American Public Health Association at its meeting in Rochester, has resigned as director of the Hygienic Laboratory of the United States Public Health Service and has accepted the position of director of E. R. Squibb and Sons biologic laboratory, New Brunswick, N. J.

BY GEORGE! SOMEBODY OUGHT TO BE HELD RESPONSIBLE THIS IS HORRIBLE!
PAPER
SHIP DISASTER! LOSS OF HUNDREDS OF LIVES!
PUBLIC
THOUSANDS OF LIVES LOST YEARLY BY PREVENTABLE DISEASES
YOU ARE RESPONSIBLE
!
GAAR WILLIAMS.

This excellent cartoon is reproduced in the Journal through the courtesy of the Indianapolis News. It will be remembered that the subject of the Editorial in the September issue of the Journal, "Disease and Disaster," was the same as that treated in this cartoon. Cartoons do indeed speak more emphatically than words.

Industrial Hygiene and Sanitation.

Iodine for First Aid Use.—*Factory* for August reports the provision for first aid work made by one of the large corporations of the business world as follows:

"Two bottles stand ready in each Department at Sears Roebuck & Company's plant for the employee who cuts, scratches or bruises himself. One is a 2-oz. glass-stoppered medicine bottle containing tincture of iodine. The other, a wide-mouthed bottle, contains applicators made of tooth picks with cotton rolled on their ends.

"Instructions for the use of iodine follow:

" 'When you have a small injury about your body whether it is a cut, a scratch, a bruise, or any other kind of injury, paint it over with iodine at once and it will prevent blood poisoning from starting.

" 'As soon as injured dip a tooth pick with cotton rolled on the end of it in the iodine and paint over the wound without washing. The iodine will kill all germs in the dirt that goes into the wound, while washing only scrubs the germs farther into the wound.

" 'When painted with the iodine, wrap the injured part in a clean cloth for a couple of days.' "

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An Endowed Factory Nurse.—The Deere Farm Implement Company has undertaken a new departure in industrial health work. The company has set aside a fund as an endowment for the purpose of maintaining a factory nurse. This nurse will perform among the employees of the company the services generally provided by visiting nurses. She will visit all employees of the company living within the city limits of Moline without charge. The fund out of which this nurse is to be paid has been placed in trust with a local women's organization, which employed a visiting nurse of its own for general service in the city for a number of years previous to this undertaking of the company.

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A Company's Message to its Men.—The Ford Motor Company has published a truly remarkable booklet entitled "Helpful Hints and Advice to Ford Employees."

On the title page is the statement that the Company wishes its workers to make the best use of the opportunities the company offers them. The whole publication shows that the Ford Company is keenly alive to the fact that healthy happy men are profitable employees.

This booklet is attractively printed in two colors on excellent paper and is illustrated on almost every page with half-tones illustrative of the improvement in the living condition of Ford employees since the inauguration of the profit-sharing plan now in force.

The text of the pamphlet explains to the workmen the profit-sharing plan, and goes into some detail in making it clear just what standard of improvement in living conditions the company expects of its men as a result.

There are suggestions regarding the personal hygiene of employees. These are followed by "Suggestions for the home" and several paragraphs describing some of the welfare services maintained by the company.

Mr. Ford's own convictions regarding the social uplift of industrial workers has been extensively commented on in the public press, but the following sentence from the paragraph on "Investigators," indicating the earnestness of the Ford Company in its effort to carry out this conviction in practice, is worth quoting:

"The investigators are engaged as important factors in one of the greatest, if not the greatest, industrial sociological plan for the benefit of humanity ever attempted; entirely new in its conception and far reaching in its ultimate end."

This pamphlet is an out-standing testimonial to the possibilities for better living conditions among the workers in large industries; and the scheme of this company, although only in its veriest infancy, promises the solution of many tough problems—social, and even political, in communities where they are given a fair trial by men with big souls and strong enough purpose to make a fight for the thing that ultimately counts in the world's industry—humanity.

A reading of this pamphlet suggests that the Ford idea might be expressed in epigram as follows: *The Company helps those who help themselves.*

Education of the Employer.—The first annual report of the Department of Shop and Factory Inspection of the State of Tennessee contains a tabulation of orders and suggestions issued relative to the improvement of working conditions and factory sanitation.

Over one tenth of these suggestions—119—were for improved sanitation and 69 more referred to ventilation and the separation of toilet facilities for the sexes. Seventeen more called for first aid chests.

One is at first struck by the fact that there were almost a thousand suggestions and only 22 orders, but inasmuch as two thirds of the suggestions had been complied with and only 3 out of the 22 orders are so listed, suggestions are apparently an effective means of securing the improvements of the sort recommended.

If this indicates, as would seem to be the case, that operators comply with suggestions in a 66 per cent. proportion, whereas only one seventh of the orders issued have been enforced, it is a fact worth thinking about.

Education and friendly suggestion is always a more potent weapon for health authorities than the police power, whether it is sought to reach the man who neglects his own personal hygiene and sanitation or the employer who disregards the health of his workers.

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Nitric Acid Accidents.—*Safety Engineering* for September reports a discussion at the Cincinnati convention of the International Association of Fire Engineers on the subject "Proper Restriction for Storage and Handling of Nitric Acid." Chief John F. Healy of the Denver Fire Department stated the following brief summary of precautions to be observed in nitric acid accidents:

Precautions to be Observed in Nitric Acid Accidents.

"As a summary of the above, the following should be strictly observed:

Don't throw sawdust on nitric acid.

Don't throw soda on nitric acid.

Don't use a portable chemical, or chemical engine on a nitric acid fire.

Use an abundance of water to dilute the acid.

Use extreme care when entering the room, to avoid unnecessary inhaling of these gases. If possible, move in the direction in which the wind is blowing.

Inhale alcohol, ether, or weak ammonia.

Drink milk or cream.

Take chloroform internally as above prescribed. Go to bed immediately and call a physician.

In case of sodium nitrate fires, water must not be used, as this causes explosion, scattering the fire in all directions. Sand or dirt is best used for smothering fires of this description."

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A Surgical Magnet.—October *Factory*, in the description of an illustration showing the use of a magnet for withdrawing an iron particle from a hand injury, contains the following expression. "Magnets which remove iron particles from wounds are valuable although they do not measure their work in tons."

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Cigarettes vs. Automobiles.—The Cadillac Motor Car Company has posted throughout its factories the following notice:

"Cigarette smoking is acquiring a hold on a great many boys in our community. The habit has grown in the last year or two. Since it is such a bad practice and is taking such a hold upon so many people, we think it is a disgrace for a grown man to smoke cigarettes, because it is not only injurious to his health, but it is such a bad example to the boys. Boys who smoke cigarettes we do not care to keep in our employ. In the future we will not hire anyone whom we know to be addicted to this habit. It is our desire to weed it entirely out of the factory just as soon as practicable. We will ask everyone in our factory, who sees the seriousness of this habit, to use his influence in having it stamped out. We have two objects in interesting ourselves in this matter: first, to help men and boys; second, we believe that men who do not smoke cigarettes or frequent the saloon can make better automobiles than those that do."—*North Carolina Health Bulletin*, August.

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Health and Industrial Efficiency.—Numerous publications, which are nowadays being issued by state and municipal health departments and by private corporations as well, are avowedly directed toward the improvement of the health of the worker. What are the incentives for all of this interest in the health of workers? The

motive of the governmental health agencies is presumably a humanitarian one, coupled with the fact that it is the duty of the state to do for the individual those things which he cannot do for himself but which are nevertheless essential to the weal of the social structure.

Is the motive of the corporations which are spending large sums to money on the departments of safety and sanitation the same altruistic one? We may doubtless say that their aim is in part a truly humanitarian one, but even if it were not there is still sufficient reason why industrial corporations should give some attention to the physical welfare of their employees. In short, it pays to have healthy workmen. Not long ago there was published in this section a note explaining how the Canadian Pacific railways had cut down the number of days of lost time to a remarkable extent through the anti-typhoid inoculation of a large number of its employees. The man of big business has long since learned that science can help him to turn out his product more cheaply. Chemistry in particular has been more and more relied upon in industry. Bacteriology and sanitation and hygiene is going to be more popular in the future.

Sanitary conveniences are almost everywhere. The common drinking cup is admittedly "a vain thing for safety" and so is the roller towel. With the sanitation provided we must turn our attention with greater insistence to the demand that the workers shall know more of the duties of hygiene they owe to themselves. Cleanliness, proper exercise, proper food eaten the right way in the right proportions and quantities, care of teeth and fresh air, yes, fresh air again. These are some of the things that we must induce people to take into account more seriously in their daily living. The sanitary problems which I have indicated of being more advanced than the hygienic ones, are problems which have to do with *things;* the hygienic problems have to do with *folks*. Therefore their solution depends not upon erecting buildings and having certain things in them but upon telling folks how to live and use the things they already have.

The man who knows more about himself and his body and its care is a better educated man than the one who does not and he is a better workman all around, not only because he is less likely to become sick and hence inefficient but because he will be relatively *more* well, more efficient, all the time. Health does make for industrial efficiency.

Paper Towels for Workmen.—In many industrial establishments the executives hesitate to make use of paper towels in place of the old fashioned insanitary roller towel because the workmen are wasteful of the paper ones, using more sections than necessary at one time. A recent issue of *Factory* reports that in one large establishment the department foremen give actual demonstrations to the workmen of the manner in which these towels should be used. It is reported that once the operation was really understood by the men they very cheerfully followed the directions that had been given them and the consumption was reduced by a large percentage.

It is a familiar sight in washrooms for the use of large numbers of persons, to see some one give the paper towel roll a pull which unwinds two or three times as much as he wishes to use. Almost never does the man take the trouble to rewind this excess and it goes into the waste basket. One brand of these towels both in its advertisements and on the wrappers prints the advice, "Use the first section as blotter to soak up the water clinging to the hands, then wipe dry with the second." Any one who will take the trouble to try this will find that it is sound advice. If factories would supply paper towels and see that their men understood how to use them, the expense would, in most instances, be little if any less than for roller towels, and, in addition, the cost in time through infection from common towels, which is, beyond doubt, an appreciable factor during a year's time in a large factory, would be eliminated.